



COLLINS - ROCKWELL
UP GRADE DATA

KWM-380 — HF-380

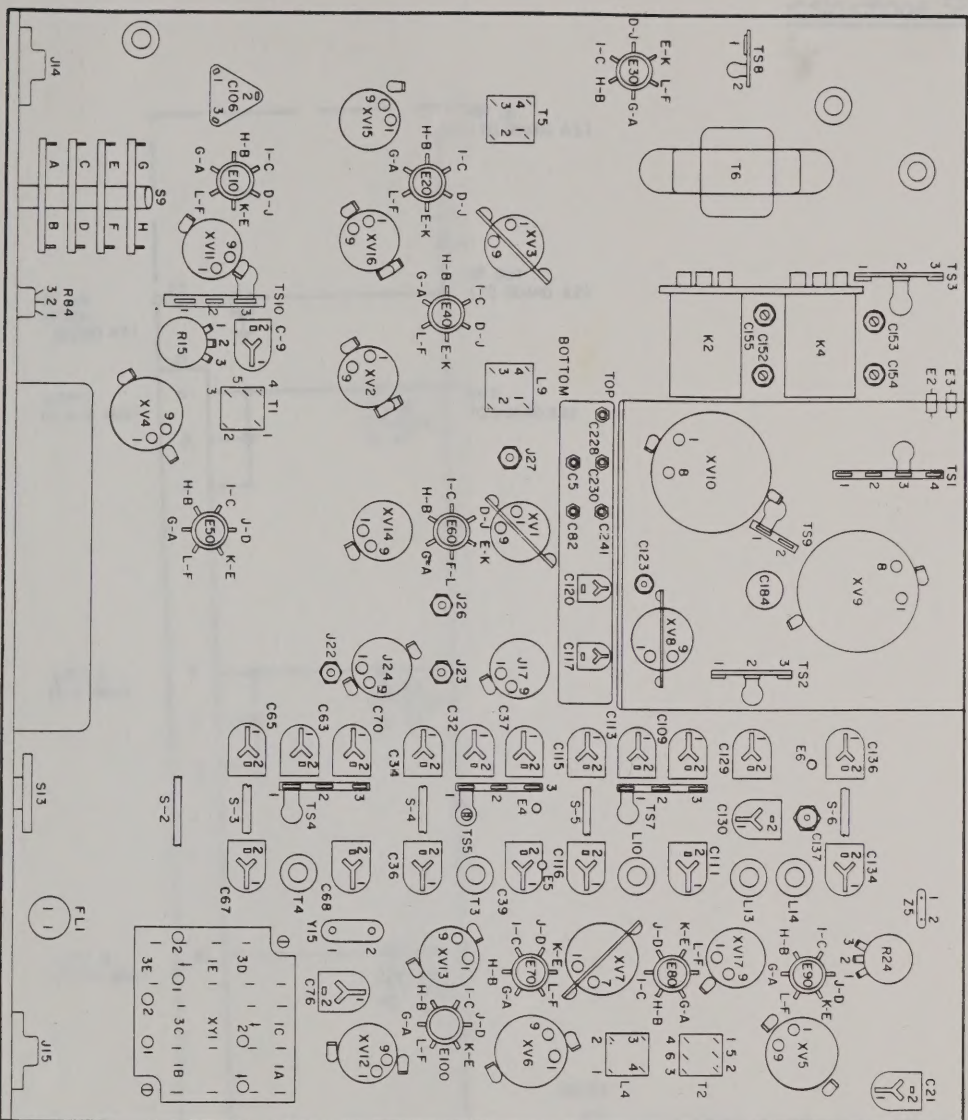
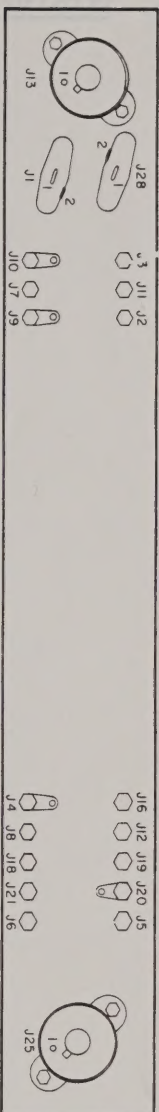


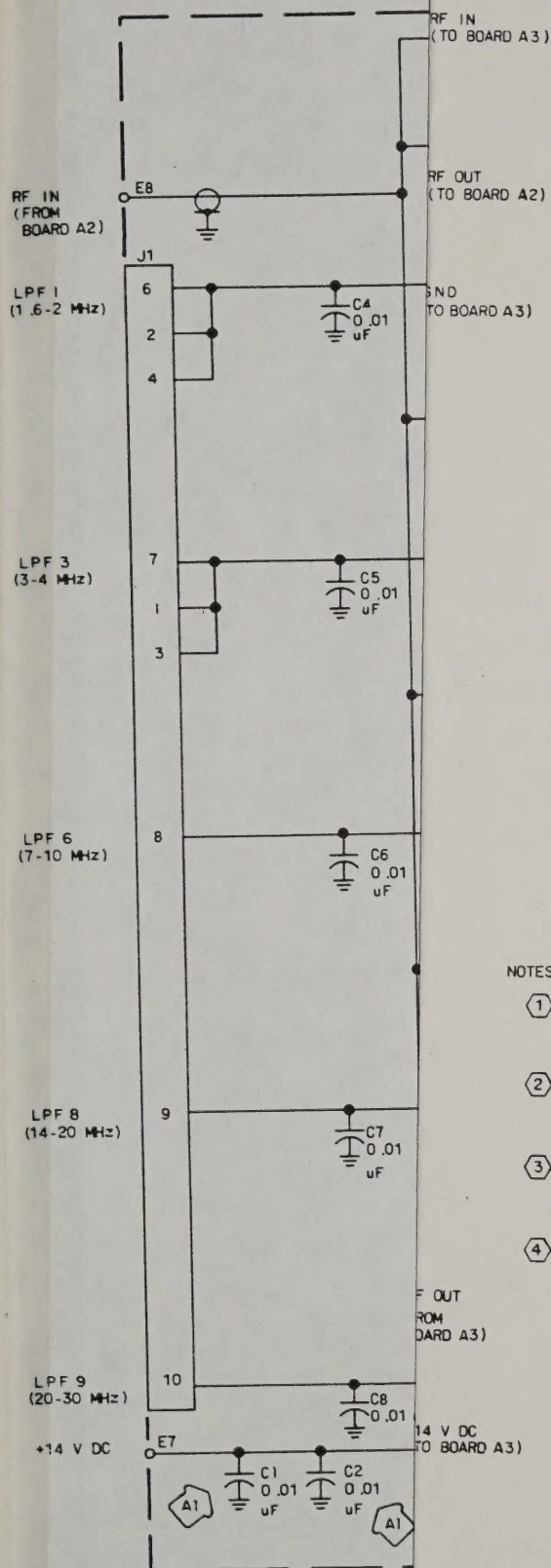
Figure 4-4. KWN-212A, location of chassis mounted components, bottom view.

<u>22</u>	<u>12</u>	<u>13</u>
<u>20</u>	<u>21</u>	<u>11</u>
<u>19</u>	<u>9</u>	<u>10</u>
<u>17</u>	<u>18</u>	<u>8</u>
<u>16</u>	<u>6</u>	<u>7</u>
<u>14</u>	<u>15</u>	<u>5</u>
<u>4</u>	<u>3</u>	<u>1</u>

- 1 WHT-BLK-RED-GRN AND R16
- 2
- 3 WHT-RED-GRN AND R17
- 4 WHT-BRN-RED-GRN
- 5 WHT-ORN-BLU
- 6 WHT-BLK-RED
- 7 WHT-BLK-RED-GRN
- 8 WHT-GRN-BLU
- 9 WHT-BLU
- 10 WHT-BLK-RED (2)
- 11 NO CONN
- 12 WHITE AND G108
- 13 WHT-BRN-RED
- 14 WHT-ORN-GRN
- 15 WHT-ORN-GRN-BLU
- 16 WHT-RED-BLU
- 17 WHT-ORN
- 18 BUS TO THE POINT
- 19
- 20 COAX, 75 OHMS
- 21 COAX, 50 OHMS
- 22 STRAP TO GRD AND BUS
TO COAX SHIELD

1	WHIT-RED-ORN (3)	16	9	10
2	WHIT-RED	14	15	8
3	WHIT-RED (2)	13	6	7
4	BUS TO GRD	11	12	5
5	R167			
6	COAX			
7	COAX (2) VIOLET AND			
8	GRADUITS			
9	STRANDS GRD AND BUS			
10	TO COAX SHIELDS			
11	BUS TO PIN 16, WHIT-BRN-ORN			
12	WHIT TO GRD			
13	BUS TO PIN 14 AND THE POINT			
14	BUS FROM PIN 13			
15	BUS TO THE POINT			
16	BUS FROM PIN 11			

- 1 WHT-RED-ORN (3)
2 WHT-RED
3 WHT-BLK (2)
4 BUS TO GRD
5 BUS TO GRD
6 BUS TO GRD
7 RIG7
8 COAX
9 COAX (2) VIOLET AND
10 STRAPOTS
11 BUS TO GRD AND BUS
12 TO COAX SHIELDS
13 BUS TO PIN 16, WHT-BRN-ORN
14 BUS FROM PIN 13
15 BUS TO THE POINT
16 BUS FROM PIN 11

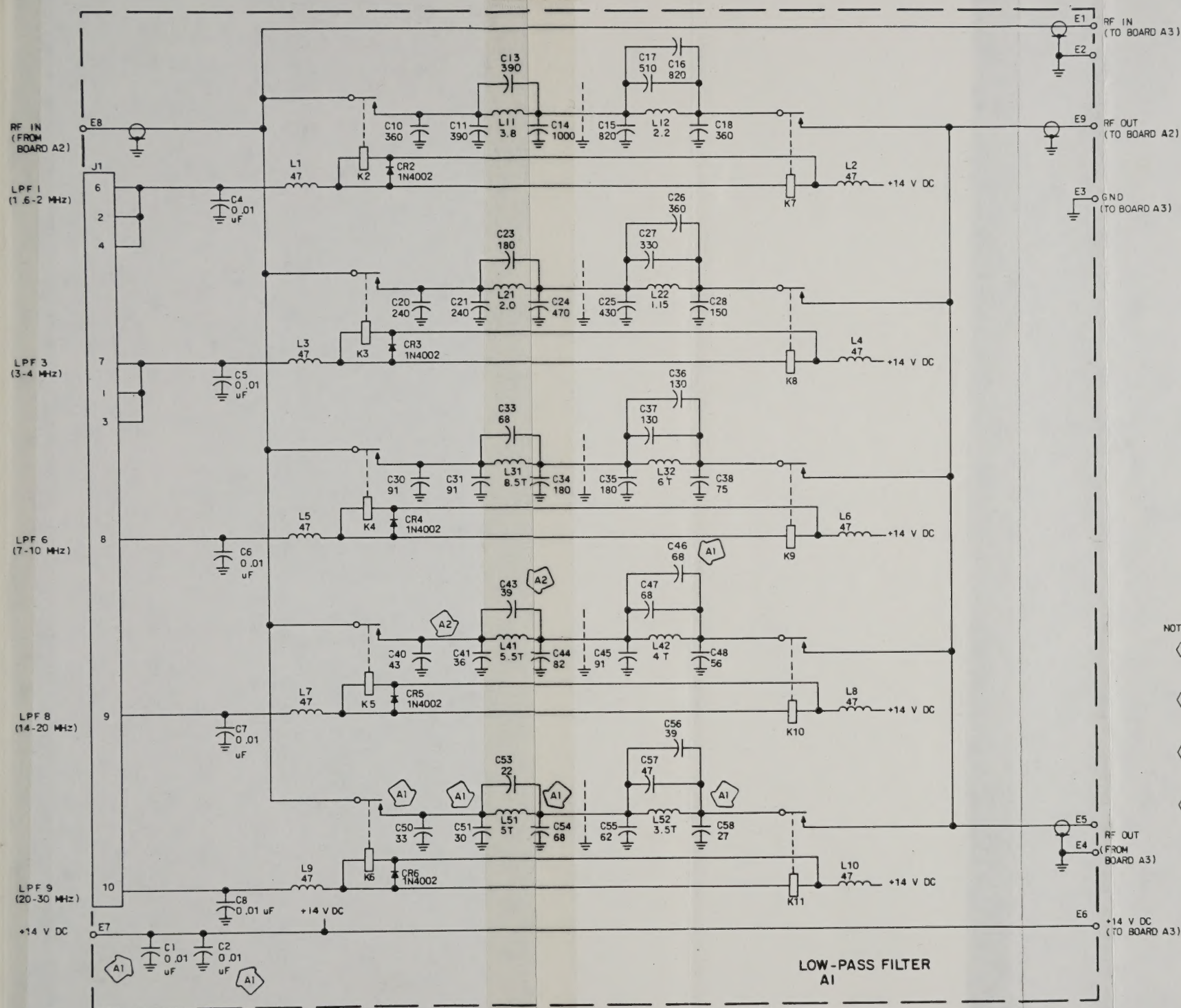


NOTES:

- ① UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN PICO FARADS AND INDUCTANCE VALUES ARE IN MICROHENRYS.
- ② PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATIONS, PREFIX WITH UNIT NUMBER AND/OR ASSEMBLY DESIGNATION.
- ③ TYPE DESIGNATIONS SHOWN MAY BE GENERIC IN FORM AND ARE FOR REFERENCE ONLY. SEE APPLICABLE PARTS LIST FOR REPLACEMENT PARTS.
- ④ C1 AND C2 CONNECTED TO A1 AS SHOWN ONLY WHEN A3 IS NOT USED.

634-6912
TPA-1686-034

Low-Pass Filter, Schematic Diagram
Figure 3 (Sheet 2)

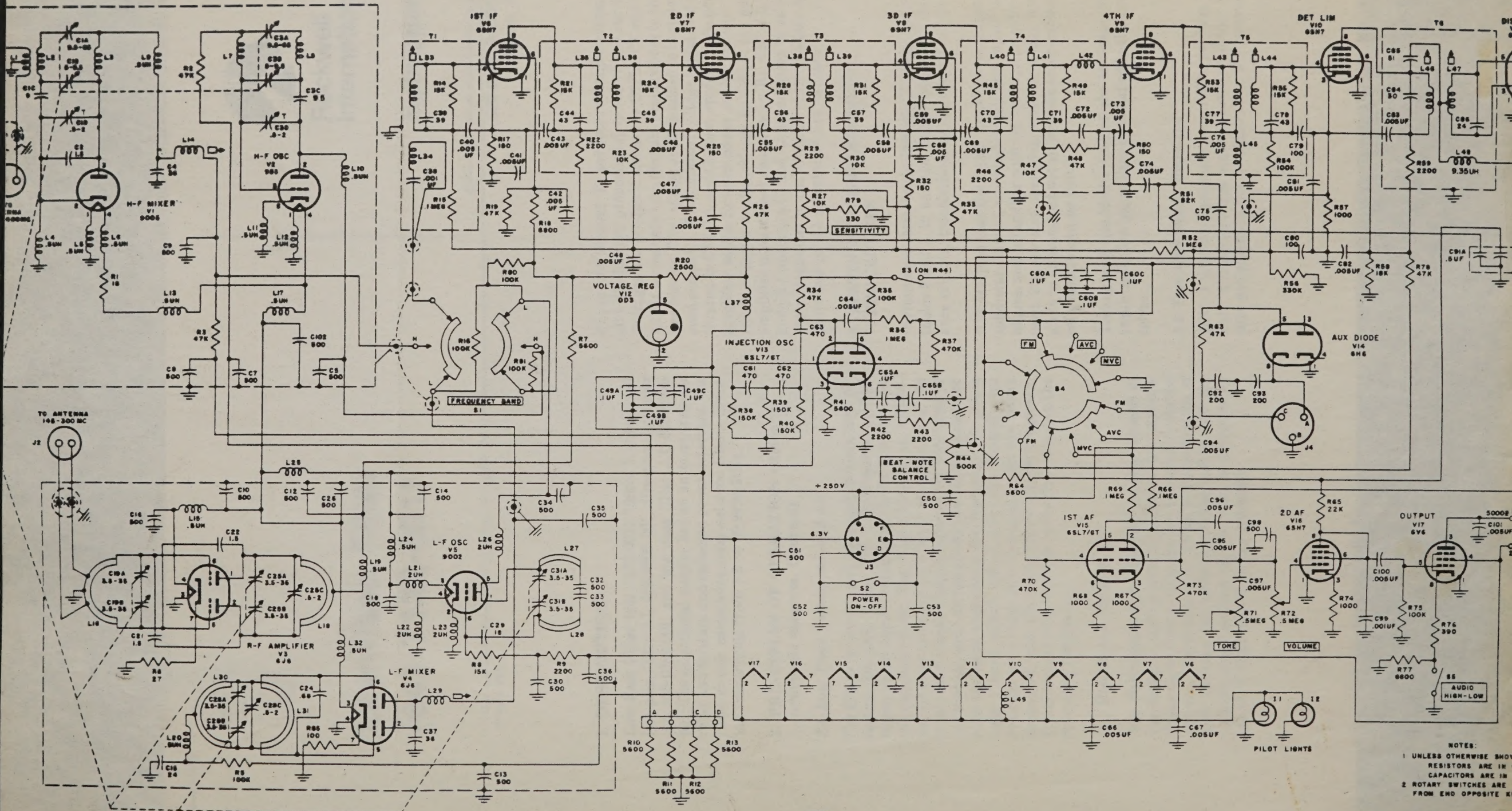


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- ① UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN PICO FARADS AND INDUCTANCE VALUES ARE IN MICROHENRYS.
- ② PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATIONS, PREFIX WITH UNIT NUMBER AND/OR ASSEMBLY DESIGNATION.
- ③ TYPE DESIGNATIONS SHOWN MAY BE GENERIC IN FORM AND ARE FOR REFERENCE ONLY. SEE APPLICABLE PARTS LIST FOR REPLACEMENT PARTS.
- ④ C1 AND C2 CONNECTED TO A1 AS SHOWN ONLY WHEN A3 IS NOT USED.

Low-Pass Filter, Schematic Diagram
Figure 3 (Sheet 2)

RADIO RECEIVER R-593/GRR SCHEMATIC DIAGRAM



NOTES:
1 UNLESS OTHERWISE SHOWN
RESISTORS ARE IN
CAPACITORS ARE IN
2 ROTARY SWITCHES ARE IN
FROM END OPPOSITE K





**Rockwell
International**

instructions

Low-Pass Filter (641-7132-001)

Collins Telecommunications Products Division

Printed in USA

523-0772530-001211

1 August 1982

1. DESCRIPTION

Low-Pass Filter (641-7132-001), figure 1, consists of low-pass filter A1, 638-6900-001, directional coupler A2, 638-6788-001, and low-pass filter A3, 638-6904-001. The directional coupler has an antenna transfer relay and forward and reflected power detectors. The filter circuit cards have relay-selected filters covering frequencies from 1.6 to 29.9999 MHz.

2. PRINCIPLES OF OPERATION (Refer to schematic diagram, figure 3)

2.1 Low Pass Filters A1 and A3

The filters on the A1 and A3 assemblies are dual pi-section low-pass types. The high-frequency rolloff begins at the upper frequency of the band covered by the respective filter. The rf path through an individual filter is switched by a relay at each end of the filter. On A1, logic 0 band enable signal, developed by the control card, energizes the two relays associated with the band containing the frequency. On A3, a logic 1 band enable signal from the control card switches on a transistor to energize the two relays associated with the band containing the frequency. The energized relays switch in the filter covering the operating frequency.

2.2 Directional Coupler A2

The directional coupler develops analog voltages of the forward and reverse rf power to the antenna. These signals are used in the power amplifier control circuits to generate ALC. Relay K1 switches the rf path between the power amplifier output and the receiver input connectors. The relay is energized by the +9 V XMT signal during transmit.

Rf current through T1 produces voltages across R1 and R2 that are proportional to the rf line current. Voltages are produced across the C1/L1/C3 and C2/L2/C4 series networks that are proportional to the rf line current. The voltage at R2 is added to that developed across C4. The combined voltage is rectified and filtered by CR2, L4, and C6, then applied to the power amplifier as the forward power analog voltage. The reflected power analog voltage applied to the power amplifier is developed similarly by R1, CR1, C3, L3, and C5. Capacitors C1 and C2 are adjusted to balance the voltages due to the sampled rf line voltage with those due to the sampled rf line current.

3. TESTING/TROUBLESHOOTING PROCEDURES

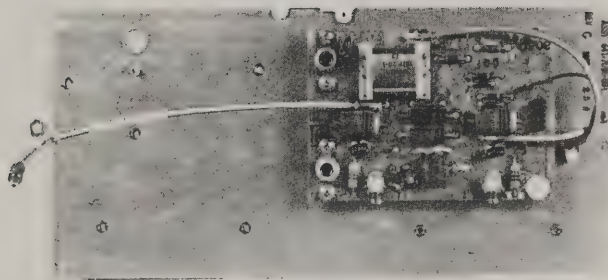
Performance tests for the low-pass filter are given in tables 2 and 3. In addition to the required performance criteria, troubleshooting comments are given.

It is assumed that the repair technician is trained in solid-state circuit troubleshooting and repair techniques, and is familiar with the test equipment to be used. Step-by-step operating procedures may not be given in all tests and not all possible troubleshooting information can be listed.

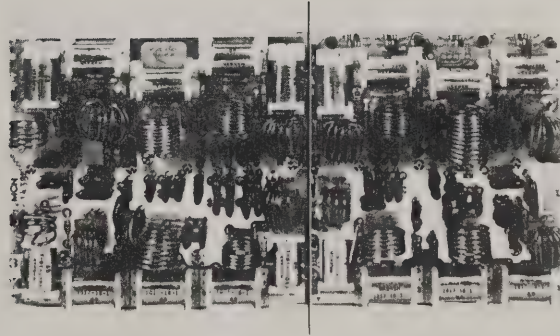
Testing and troubleshooting of the low-pass filter requires the low-pass filter be installed in the transmitter.

3.1 Test Equipment Required

Table 1 lists the equipment required to perform the tests. A suggested type is given; however, if that specific equipment is not available, any that meets or



A2



A1

A3

TPA-5794-017

Low-Pass Filter Assembly
Figure 1

exceeds the indicated minimum specifications is acceptable for use.

3.2 Performance Test

The following test procedures measure the performance of the low-pass filter. After being repaired, repeat the numbered test where repair was performed to verify that no further malfunctions exist.

3.2.1 Preliminary Setup

Be certain no power is applied to the equipment until instructed to do so in the procedures. Do not connect power with power switches turned on.

Connect the equipment as instructed in the procedures for each test.

3.2.2 Test Procedures

Perform the tests as given in tables 2 and 3.

Table 1. Test Equipment Required.

ITEM	USED FOR	SUGGESTED TYPE	MINIMUM SPECIFICATIONS
Rf load	Terminating filter output	Bird 8135	150-W rf, 50-ohm, 2 to 30 MHz
Vector impedance meter	Measuring phase angle and impedance of filters	Hewlett-Packard 4815A	Phase angles to $\pm 10^\circ$, impedance to 70 ohms
Rf signal generator	Applying rf signals to filters	Hewlett-Packard 8640B	3 to 40 MHz, 2-V rf output, 50-ohm
Rf voltmeter	Measuring rf voltage at filters	Boonton 92C	0 to 0.1 V rf
Coax jumper (A2 P2 to A2P3)	Bypassing low-pass filter	P/N 634-8283-011	
Rf load	Terminating directional coupler transmit output	Bird 8329	150-W rf, 50-ohm, 2 to 30 MHz
Power meter	Measuring rf power output	HP 432B	88 watts at 30 MHz
Rf source	Supplying 100-watt rf input	KWM 380	100-watt, 30-MHz
12-volt power supply	Applying +9 V dc to directional coupler	HP 721A	+9 V dc
Digital voltmeter	Detector output measurements	HP 8000A	0 to 5 V dc

Table 2. Low-Pass Filter A1 Testing and Troubleshooting Procedures.

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL																																																				
1. Test setup	a. Disconnect coax from receiver-exciter J1 to power amplifier (to keep rf from power amplifier). b. Connect 50-ohm load (Bird 8135) to A2J2. c. Connect vector impedance meter to A2J1. (Use probe-to-BNC adapter, then BNC-to-phono connector adapter for short as possible connection.) d. Turn on transceiver.																																																						
2. Filter tuning impedance measurement	a. Key transceiver (press in MOX switch) and perform following steps for each filter in A1. (1) Select transceiver frequency falling within band of filter being tested. <table><thead><tr><th><u>FILTER</u></th><th><u>DIAL FREQ</u></th></tr></thead><tbody><tr><td>A2 L11/L12</td><td>1.95</td></tr><tr><td>A3 L11/L12</td><td>2.50</td></tr><tr><td>A2 L21/L22</td><td>3.55</td></tr><tr><td>A3 L21/L22</td><td>4.50</td></tr><tr><td>A3 L31/L32</td><td>6.00</td></tr><tr><td>A2 L31/L32</td><td>7.15</td></tr><tr><td>A3 L41/L42</td><td>12.00</td></tr><tr><td>A2 L41/L42</td><td>14.15</td></tr><tr><td>A2 L51/L52</td><td>29.00</td></tr></tbody></table> (2) Slowly sweep meter frequency across filter band while noting input impedance and maximum phase angle for each filter. <table><thead><tr><th><u>FREQ RANGE (MHz)</u></th><th><u>FILTER</u></th></tr></thead><tbody><tr><td>1.6-2</td><td>A1 L11/L12</td></tr><tr><td>2-3</td><td>A3 L11/L12</td></tr><tr><td>3-4</td><td>L1 L21/L22</td></tr><tr><td>4-5</td><td>A3 L21/L22</td></tr><tr><td>5-7</td><td>A3 L31/L32</td></tr><tr><td>7-10</td><td>A1 L31/L32</td></tr><tr><td>10-14</td><td>A3 L41/L42</td></tr><tr><td>14-20</td><td>A1 L41/L42</td></tr><tr><td>20-30</td><td>A1 L51/L52</td></tr></tbody></table>	<u>FILTER</u>	<u>DIAL FREQ</u>	A2 L11/L12	1.95	A3 L11/L12	2.50	A2 L21/L22	3.55	A3 L21/L22	4.50	A3 L31/L32	6.00	A2 L31/L32	7.15	A3 L41/L42	12.00	A2 L41/L42	14.15	A2 L51/L52	29.00	<u>FREQ RANGE (MHz)</u>	<u>FILTER</u>	1.6-2	A1 L11/L12	2-3	A3 L11/L12	3-4	L1 L21/L22	4-5	A3 L21/L22	5-7	A3 L31/L32	7-10	A1 L31/L32	10-14	A3 L41/L42	14-20	A1 L41/L42	20-30	A1 L51/L52	Maximum phase angle, θ, for any filter is $\pm 10^\circ$. Impedance, Ω, as indicated for max phase deviation. <table><thead><tr><th><u>IF PHASE IS NMT</u></th><th><u>IMPED-ANCE RANGE IS</u></th></tr></thead><tbody><tr><td>$\pm 10^\circ$</td><td>46-55</td></tr><tr><td>$\pm 8^\circ$</td><td>44-57</td></tr><tr><td>$\pm 6^\circ$</td><td>43-58</td></tr><tr><td>$\pm 4^\circ$</td><td>42-59</td></tr><tr><td>$\pm 2^\circ$</td><td>42-60</td></tr></tbody></table>	<u>IF PHASE IS NMT</u>	<u>IMPED-ANCE RANGE IS</u>	$\pm 10^\circ$	46-55	$\pm 8^\circ$	44-57	$\pm 6^\circ$	43-58	$\pm 4^\circ$	42-59	$\pm 2^\circ$	42-60	If not within specified limits, increase output coil spacing to set to maximum allowable positive value at high end of band. Adjust input coil for middle and low end of band. Repeat step (2) to recheck measurement.
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$\pm 4^\circ$	42-59																																																						
$\pm 2^\circ$	42-60																																																						
3. Stop band attenuation	b. Unkey transmitter and disconnect vector impedance meter and 50-ohm load.																																																						
(Cont)	a. Connect rf signal generator to A2J1. Adjust generator output for 1.0-V. Maintain this level throughout test. b. Connect rf voltmeter to A2J2 (or transceiver rf connector J4).																																																						

Table 2. Low-Pass Filter A1 Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL																																								
3. (Cont)	c. Tune transceiver to frequency falling within band of filter being tested. d. Key transceiver e. Set signal generator output to frequency indicated and measure rf voltage. Repeat for all filters. <table><tr><td></td><td>FILTER (MHz)</td><td>DIAL FREQ</td><td>SIG GEN FREQ (MHz)</td></tr><tr><td></td><td>1.6-2</td><td>1.9</td><td>3.2</td></tr><tr><td></td><td>2-3</td><td>2.5</td><td>4.0</td></tr><tr><td></td><td>3-4</td><td>3.5</td><td>6.0</td></tr><tr><td></td><td>4-5</td><td>4.5</td><td>8.0</td></tr><tr><td></td><td>5-7</td><td>6.0</td><td>10.0</td></tr><tr><td></td><td>7-10</td><td>8.0</td><td>14.0</td></tr><tr><td></td><td>10-14</td><td>12.0</td><td>20.0</td></tr><tr><td></td><td>14-20</td><td>15.0</td><td>28.0</td></tr><tr><td></td><td>20-30</td><td>28.0</td><td>40.0</td></tr></table> f. Unkey transceiver. Disconnect signal generator, voltmeter, and load. Reconnect coax between power amplifier P1 and receiver-exciter J1.		FILTER (MHz)	DIAL FREQ	SIG GEN FREQ (MHz)		1.6-2	1.9	3.2		2-3	2.5	4.0		3-4	3.5	6.0		4-5	4.5	8.0		5-7	6.0	10.0		7-10	8.0	14.0		10-14	12.0	20.0		14-20	15.0	28.0		20-30	28.0	40.0	Rf voltage through filter is not more than 0.056-V.	Check for correct component values and possible coil damage.
	FILTER (MHz)	DIAL FREQ	SIG GEN FREQ (MHz)																																								
	1.6-2	1.9	3.2																																								
	2-3	2.5	4.0																																								
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	14-20	15.0	28.0																																								
	20-30	28.0	40.0																																								

Table 3. Directional Coupler A2 Testing and Troubleshooting Procedures.

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
1. Null	Note Because of the unlikelihood of a fault in the directional coupler, this circuit need not be tested unless a malfunction is suspected. In normal operation, for 100-watt rf output, forward power detected output is $+2.2 \pm 0.2$-V dc and reflected power detected output is 0.0 V dc. - Remove assembly A2 from transceiver. - Temporarily connect coax jumper between P2 and P3 on A2. - Connect 50-ohm load to (Bird 8135) A2J2. - Connect 30-MHz, 100-watt output source to A2P1. Turn on source. - Using digital voltmeter measure dc voltage at: - A2J3-2 - A2J3-3 - Turn off rf source. Connect source to A2J2 and load to A2P1. Turn on source. - Using digital voltmeter, measure dc voltage at: - A2J3-2 - A2J3-3 - Turn off rf source.	Not more than $+0.1$-V dc $+2.2 \pm 0.2$-V dc $+2.2 \pm 0.2$-V dc Not more than $+0.1$-V dc	Adjust A2C1 for null, not more than $+0.1$-V dc. Adjust A2C2 for correct voltage. Adjust A2C1 for correct voltage. Adjust A2C2 for null, not more than $+0.1$-V dc
2. Output	Connect 50-ohm load (Bird 8329) in parallel with 50-ohm load (Bird 8135) connected to A2J2. Connect power meter to 50-ohm load (Bird 8329). Note Keep coax lengths between each rf load and A2J2 as short as possible. Load impedance at A2J2 as measured by vector impedance meter should be 25 ± 10 ohms at $0 \pm 10^\circ$ phase angle at 30 MHz.		
(Cont)			

4. REPAIR

Repair of the low-pass filter is accomplished using standard maintenance and circuit card repair procedures.

5. PARTS LIST/DIAGRAMS

5.1 Introduction

Caution

This equipment contains electrostatic discharge sensitive (ESDS) devices. Special handling methods and materials must be used to prevent equipment damage. Refer to the maintenance section for the equipment before assembly/disassembly or repair is performed. ESDS items are identified in the description column of the parts list by (ESDS).

All parts list illustrations containing ESDS items are shown with the following symbol:



This paragraph assists in identification and requisition of parts. A parts location illustration, schematic diagram, parts list tabulation, and modification history are included. The parts location illustration is a design engineering drawing that shows exact component placement on the circuit cards.

Use the reference designator indicated on the schematic and parts location diagram to locate parts in the parts list tabulation. The description, Collins part number, usable on code, manufacturer's code and manufacturer's part number are listed for each reference designator.

5.2 Parts List

REF DES Column — Reference designators of each part/subassembly are listed in alphanumeric sequence. These are the reference designators shown on the parts location drawing and schematic diagram.

DESCRIPTION Column — Lists the noun name, modifier, descriptive information, and modification.

Modifications are identified by an alphanumeric identifier assigned to each design change. These identifiers are referenced in the DESCRIPTION column of the parts list in parentheses and on the schematic diagram inside an arrow that points to the change. Each change relates to the revision identifier (REV) stamped on the circuit card/subassembly and is listed in the EFFECTIVITY column of the modification history. NA (not applicable) in the REVISION IDENT column indicates a documentation change only. The change does not affect the circuit card/subassembly components.

COLLINS PART NUMBER Column — Lists the Collins part number for each item in the parts list.

USABLE ON CODE Column — Part variations within a group of equipment are indicated by a letter code (A, B, C, etc). Absence of a code indicates part applies to all models.

MFR CODE Column — Lists the manufacturer's code from which selected parts can be procured.

MFR PART NUMBER Column — Lists the manufacturer's part number for the selected parts.

Listed below are manufacturer's names and addresses for the manufacturer's codes found in this parts list.

MFR CODE	MANUFACTURER'S NAME AND ADDRESS
00779	AMP INC P O BOX 3608 HARRISBURG PA 17105
02113	COILCRAFT INC 1102 SILVER LAKE RD CARY IL 60013
04713	MOTOROLA INC SEMICONDUCTOR GROUP 5005 E MCDOWELL RD PHOENIX AZ 85008
12998	QUALITY NAME PLATE INC MILL ROAD EAST GLASTONBURY CT 06025
13499	ROCKWELL INTERNATIONAL CORP COLLINS TELECOMMUNICATIONS PRODUCTS DIV 855 35TH ST NE P O BOX 728 CEDAR RAPIDS IA 52498
18542	WABASH RELAY AND ELECTRONICS DIV WABASH INC 1ST AND WEBSTER STS P O BOX 708 WABASH IN 46992

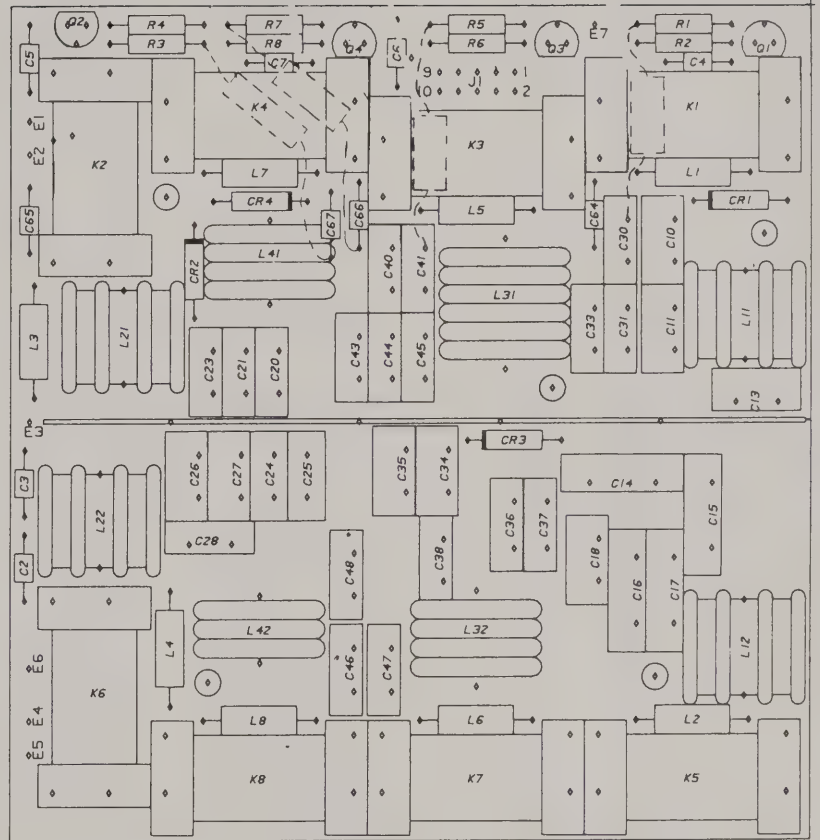
MFR CODE	MANUFACTURER'S NAME AND ADDRESS
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20462	PREM ENTERPRISES INC 3519 N CHAPEL HILL MC HENRY IL 60050
25184	PRECISION RUBBER PRODUCTS CORP HARTMAN DRIVE LEBANON TN 37087
28480	HEWLETT-PACKARD CO CORPORATE HQ 3000 HANOVER ST PALO ALTO CA 94304
31433	UNION CARBIDE CORP ELECTRONICS DIV HWY 276 SE P O BOX 5928 GREENVILLE SC 29606
52072	CIRCUIT ASSEMBLY CORP 3169 REDHILL AVE COSTA MESA CA 92626
56289	SPRAGUE ELECTRIC CO 87 MARSHALL ST NORTH ADAMS MA 01247
72136	ELECTRO MOTIVE CORP SUBSIDIARY OF INTERNATIONAL ELECTRONICS CORP P O BOX 7600 LAUTER AVE FLORENCE SC 29501
77250	ALLIED PRODUCTS CORP PHEOLL MFG CO DIV 5700 W ROOSEVELT RD CHICAGO IL 60650
81349	MILITARY SPECIFICATIONS
82389	SWITCHCRAFT INC SUB OF RAYTHEON CO 5555 N ELSTRON AVE CHICAGO IL 60630
96906	MILITARY STANDARD
98291	SEAELECTRO CORP 225 HOYT MAMARONECK NY 10544

5.3 Equipment Covered

Listed below are the circuit cards/subassemblies with the latest effectivity covered by these instructions.

CIRCUIT CARD/ SUBASSEMBLY	COLLINS PART NUMBER	LATEST EFFECTIVITY
Low-Pass Filter	641-7132-001	REV D
Low-Pass Filter Circuit Card	638-6904-001	REV J
Standard Low-Pass Filter Circuit Card	638-6900-001	REV F
Directional Coupler	638-6788-001	REV N



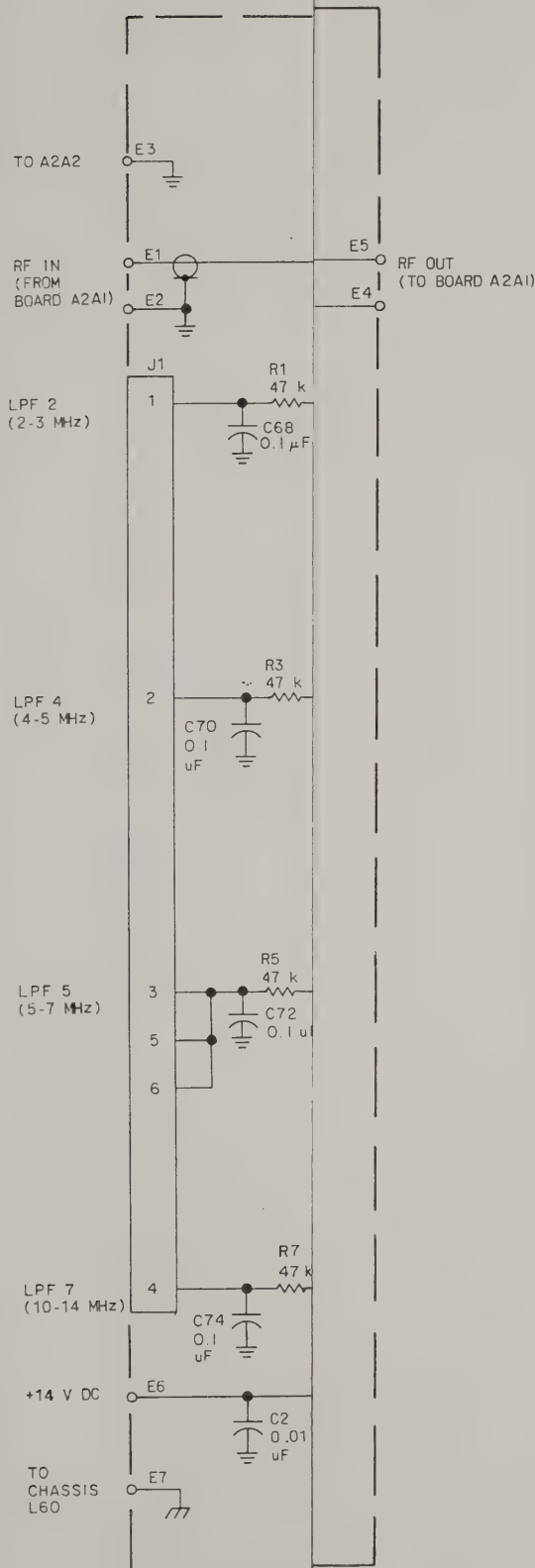
**ELECTROSTATIC
SENSITIVE DEVICES**
OBSERVE PRECAUTIONS
FOR HANDLING

11/12

B

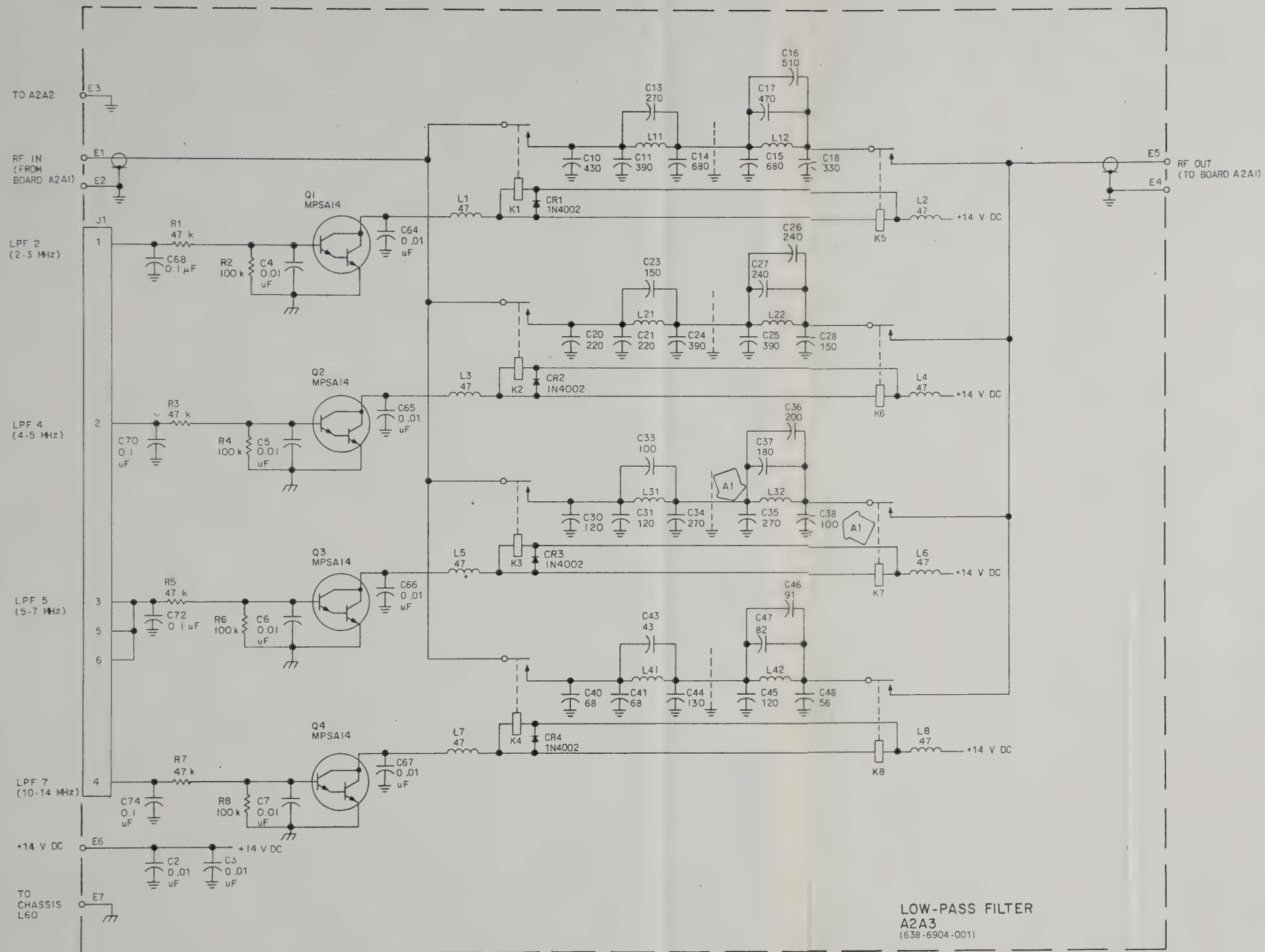
REF DES	DESCRIPTION	COLLINS PART NUMBER	USABLE ON CODE	MFR CODE	MFR PART NUMBER	SMR CODE	REF DES	DESCRIPTION
	LOW PASS FILTER	641-7132-001					R8	RESISTOR,FXD CMPSN, 0.10MEGO, 10%,
H1	WASHER,LOCK SST, 0.115 ID X 0.209 OD (QTY 1)	310-0279-000		96906	MS35338-135			STANDARD LOW PASS FILTER CIRCUIT CA
H2	NUT,PLAIN,HEX SST, 4-40 (QTY 1)	313-0132-000		77250	P313-0132-000		CR1	NOT USED
H3	SCREW,MACH STL, 4-40 X 1/2 (QTY 1)	343-0137-000		96906	MS1957-17		CR2-CR6	SEMICOND DEVICE
H4	WASHER,FLAT CRES, 0.125ID X 0.250 OD	310-0779-030		96906	MS15795-803		C1	NOT USED
H5	WASHER,LOCK SST, 0.115 ID X 0.209 OD (QTY 5)	310-0279-000		96906	MS35338-135		C2-C8	CAPACITOR,FXD CER DIEL, 0.01UF,M20%
H6	SCREW,MACH SST, 4-40 X 5/16 (QTY 11)	343-0134-000		96906	MS1957-14		C9	NOT USED
H7	WASHER,FLAT CRES, 0.125ID X 0.250 OD (QTY 7)	310-0779-030		96906	MS15795-803		C10	CAPACITOR,FXD MICA DIEL, 360PF, 5%,
H8	SCREW,MACH STL, 4-40 X 1/2 (QTY 5)	343-0137-000		96906	MS1957-17		C11	CAPACITOR,FXD MICA DIEL, 390PF, 5%,
H9	WASHER,FLAT CRES, 0.125ID X 0.250 OD (QTY 5)	310-0779-030		96906	MS15795-803		C12	NOT USED
H10	WASHER,LOCK SST, 0.115 ID X 0.209 OD (QTY 5)	310-0279-000		96906	MS35338-135		C13	CAPACITOR,FXD MICA DIEL, 390PF, 5%,
L60	COIL,RF 2200UH	240-2715-530		96906	MS75089-27		C14	CAPACITOR,FXD MICA DIEL, 1000PF, 5%,
MP1	GROMMET,RUBBER	201-0001-000		96906	MS35489-4		C15,C16	CAPACITOR,FXD MICA DIEL, 820PF, 5%,
MP2	CABLE	641-7100-013			641-7100-013		C17	CAPACITOR,FXD MICA DIEL, 510PF, 5%,
MP3	LABEL,PRESS SENS (ESDS)	280-2745-020		12998	280-2745-020		C18	CAPACITOR,FXD MICA DIEL, 360PF, 5%,
MP4	MOUNT,FILTER	641-7130-001					C19	NOT USED
A2A3	LOW PASS FILTER- OPT	638-6904-001					C20,C21	CAPACITOR,FXD MICA DIEL, 240PF, 5%,
A2A1	LOW PASS FILTER	638-6900-001					C22	NOT USED
A2A2	DIRECTIONAL COUPLER	638-6788-001			638-6788-001		C23	CAPACITOR,FXD MICA DIEL, 180PF, 5%,
							C24	CAPACITOR,FXD MICA DIEL, 470PF, 5%,
A2A3	LOW PASS FILTER CIRCUIT CARD	638-6904-001					C25	CAPACITOR,FXD MICA DIEL, 430PF, 5%,
CR1-CR4	SEMICOND DEVICE	353-6442-020		04713	1N4002		C26	CAPACITOR,FXD MICA DIEL, 360PF, 5%,
C1	NOT USED						C27	CAPACITOR,FXD MICA DIEL, 330PF, 5%,
C2-C7	CAPACITOR,FXD CER DIEL, 0.01UF,M20%P80%,50V	913-3331-020		56289	292CY5U103D8050		C28	CAPACITOR,FXD MICA DIEL, 150PF, 5%,
C8,C9	NOT USED						C29	CAPACITOR,FXD MICA DIEL, 91PF, 5%,
C10	CAPACITOR,FXD MICA DIEL, 430PF, 5%, 500V	912-2861-000		72136	DM15F431J300MW4C		C30-C32	NOT USED
							C33	CAPACITOR,FXD MICA DIEL, 68PF, 5%,
C11	CAPACITOR,FXD MICA DIEL, 390PF, 5%, 500V	912-2858-000		81349	CM05FD391J03		C34,C35	CAPACITOR,FXD MICA DIEL, 180PF, 5%,
C12	NOT USED						C36,C37	CAPACITOR,FXD MICA DIEL, 130PF, 5%,
C13	CAPACITOR,FXD MICA DIEL, 270PF, 5%, 500V	912-2846-000		81349	CM05FD271J03		C38	CAPACITOR,FXD MICA DIEL, 75PF, 5%,
C14,C15	CAPACITOR,FXD MICA DIEL, 680PF, 5%, 500V	912-2849-000		81349	CM06FD681J03		C39	NOT USED
C16	CAPACITOR,FXD MICA DIEL, 510PF, 5%, 500V	912-2980-000		81349	CM06FD511J03		C40	CAPACITOR,FXD MICA DIEL, 43PF, 5%,
C17	CAPACITOR,FXD MICA DIEL, 470PF, 5%, 500V	912-2974-000		81349	CM06FD471J03		C41	CAPACITOR,FXD MICA DIEL, 47PF, 5%,
C18	CAPACITOR,FXD MICA DIEL, 330PF, 5%, 500V	912-2852-000		81349	CM05FD331J03		C42	NOT USED
C19	NOT USED						C43	CAPACITOR,FXD MICA DIEL, 36PF, 5%,
C20,C21	CAPACITOR,FXD MICA DIEL, 220PF, 5%, 500V	912-2840-000		81349	CM05FD221J03		C44	CAPACITOR,FXD MICA DIEL, 39PF, 5%,
C22	NOT USED						C45	CAPACITOR,FXD MICA DIEL, 82PF, 5%,
C23	CAPACITOR,FXD MICA DIEL, 150PF, 5%, 500V	912-2828-000		81349	CM05FD151J03		C46	CAPACITOR,FXD MICA DIEL, 91PF, 5%,
C24,C25	CAPACITOR,FXD MICA DIEL, 390PF, 5%, 500V	912-2858-000		81349	CM05FD391J03		C47	CAPACITOR,FXD MICA DIEL, 68PF,

HF Control Card Conversion
MP1
MP2



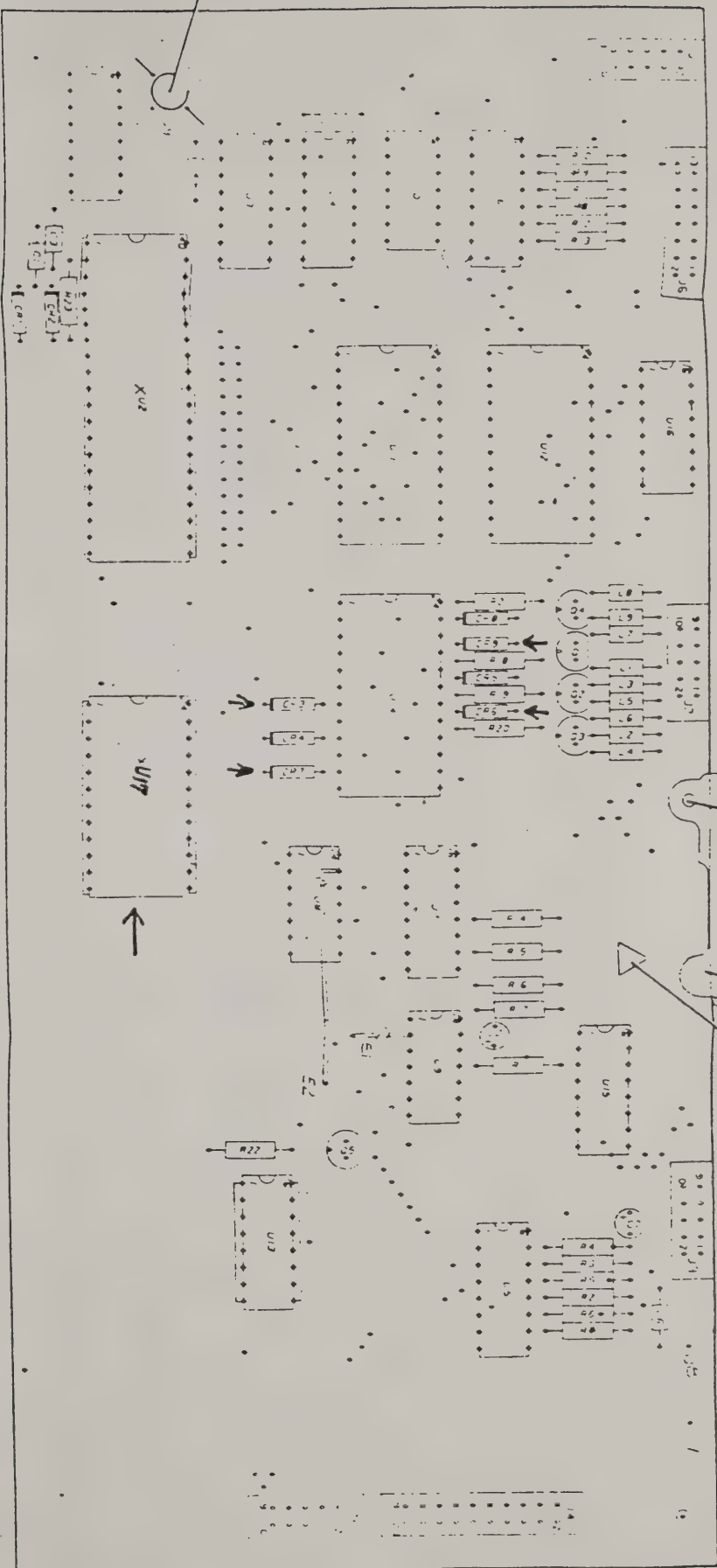
634-6912
TPA-1686-034

Low-Pass Filter, Schematic Diagram
Figure 3 (Sheet 3)



Low-Pass Filter, Schematic Diagram
Figure 3 (Sheet 3)

HF Control Card Conversion



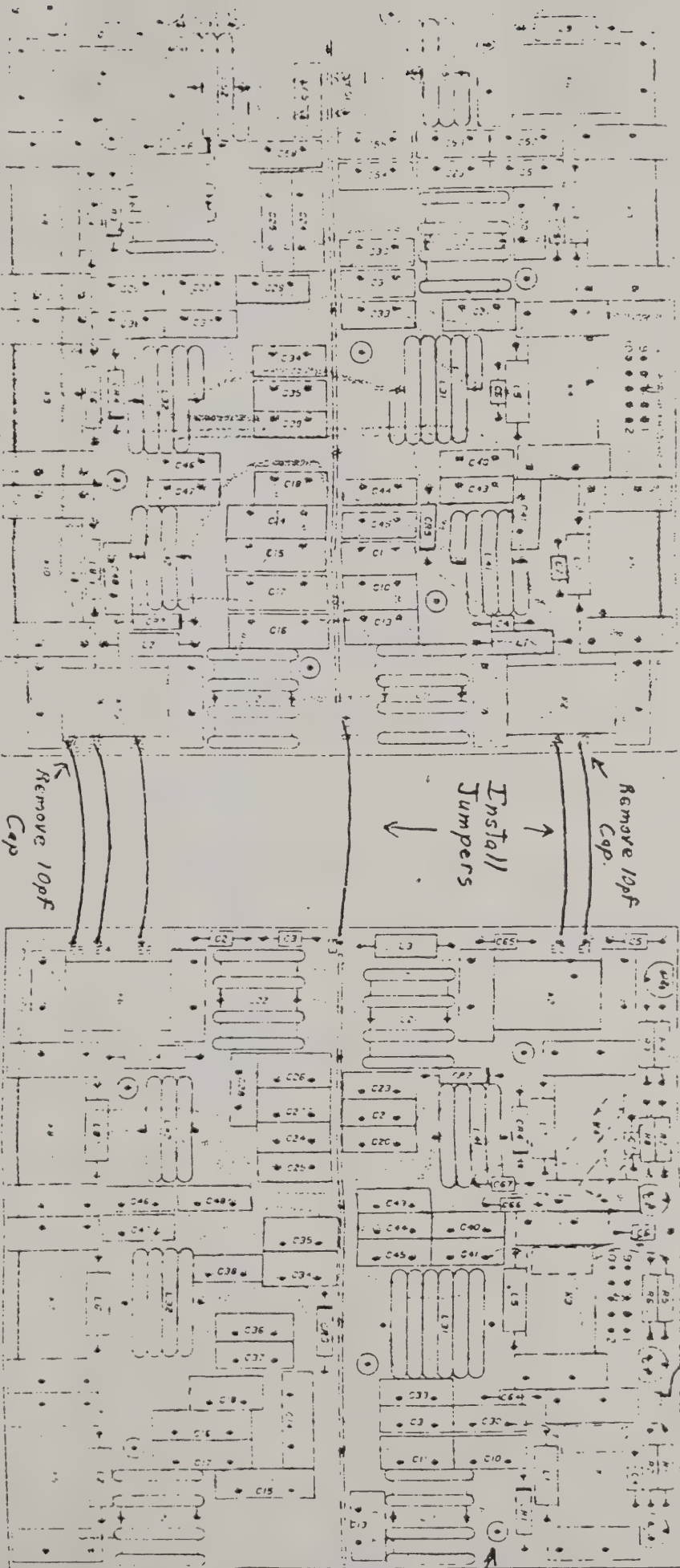
To Convert KWM-380 Control Card to HF-380 Capability remove diodes CR3,6,7,9 and install HF ROM at U17. (Part # 351-8870-000)

Filter board A2A3 must be installed when diodes are removed!

Control, Paris Location
Figure 6 (Sheet 1 of 2)

Add Low Pass Filter card A2A3 To KVM-380 for HF XM1T Capability

Instructions 523-0770690



LOW PASS FILTER A2A1

LOW PASS FILTER A2A3

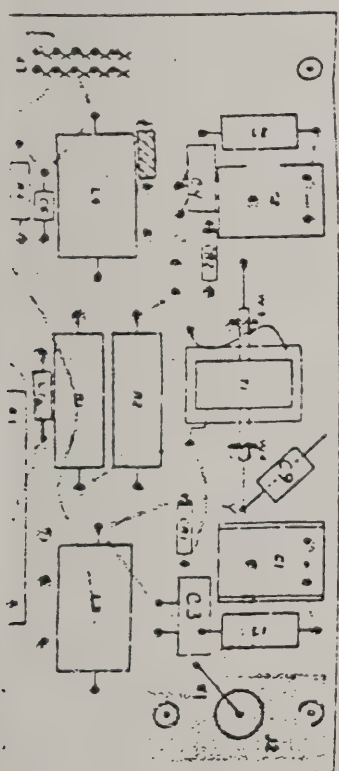
#638-6904-001

"Mounting Hardware for Board"

- 1 - Screw 343-0137-000 2 1/2"
- 4 - Screws 343-0134-000 1/8"
- 5 - Flat Washers 310-0779-030

"Mounting Hardware for Ground"

- 1 - Lug 304-3110-010
- 1 - Nut 313-0132-000
- 1 - Flat Washer 310-0779-030
- 1 - Lock Washer 310-0279-000



To flon Terminal on backside of Plate. Route wire from E7 thru hole.

Ground Lug
2.2mhy

2.2mhy choke

#240-2715-530

Bus Wire 421-2220-000
Insulated Wire 439-4000-000

Surplus Sales of Nebraska

A Division of the

R.L. Grinnell Corporation

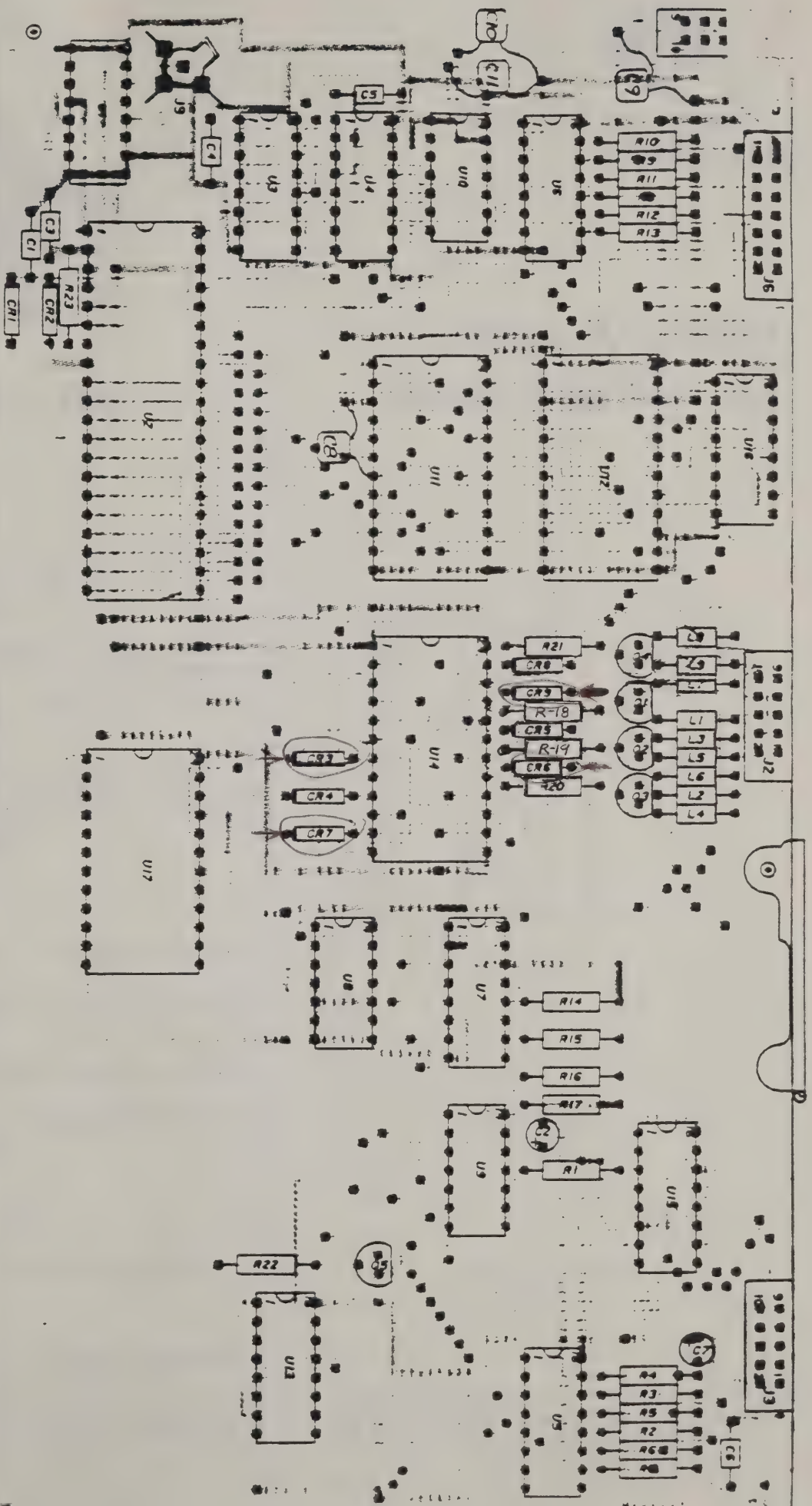
1315 Jones Street
Omaha, Nebraska 68102
Tele: 402-346-4750
Fax: 402-346-2939

"Where the Hard to Find Parts are Found"

INSTALLATION OF A3 BOARD AND CONTROL BOARD MOD ON KWM(HF)-380

1. Unplug unit
2. Remove chassis and top cover to circuit card chamber.
3. Locate low pass filter area in rear compartment.
4. Slowly pull up on handle of metal filter mounting plate, sliding entire plate up from chassis.
5. Make a note of cable connections on A2 Directional Coupler board and remove cables.
6. Set entire assembly on bench with existing A1 board situated to the left.
7. Remove A1 board from plate.
8. Remove 10 pF capacitors as indicated in drawing. Clean holes with solder wick.
9. Reinstall A1 board.
10. CAUTION: BE CAREFUL NOT TO MOVE COILS ON THIS BOARD DURING INSTALLATION. YOU MAY DETUNE YOUR LOW PASS FILTER. Remove wrap from new A3 board. Remove stand offs and discard.
11. Notice 2.2 mH choke with solder lug. Insert the choke through the 1/2" hole in metal plate. This lug will attach to ground in next step. Disregard the teflon standoff on back of plate.
12. Position new A3 board over mounting stand offs to the right of A1. Slowly insert the six jumpers into adjacent holes on the A1 board.
13. Insert longest screw into hole marked on drawing. Do not tighten.
14. Insert remaining four screws into other mounting holes. Now tighten all screws.
15. Slip lug from choke over long bolt and tighten nut.
16. This completes installation of A3 filter board. Reattach cables and slide assembly into compartment. Install loose 10 pin header cable to 10 pin jack on A3 board. Notice the polarity.
17. To modify your control card, pull card from cage.
18. Cut or remove diodes at four positions as marked on drawing.
19. Remove U17 and replace with the proper 351-8870-060 ROM. If you do not have a socket in this position, a socket should be installed.
20. This completes installation of the general coverage transmit modification to your KWM-380. You can button her back up.

Surplus Sales



CONTROL CARD A8

Control Card A8, Parts Location and Wiring Diagram
Figure 5



Rockwell
International

Pro-markTM HF accessories

Collins AC-3801 Noise Blanker Kit

1. DESCRIPTION

The AC-3801 Noise Blanker Kit, Collins part number 641-7105-001, is for use in transceivers located in high-impulse type rf noise environments.

The noise blanker, transceiver A11 subassembly, is installed into the KWM-380 or HF-380 card cage and is connected to the receiver-exciter circuit card on the bottom of the chassis.

After installation, the noise blanker is enabled by pressing the transceiver front panel NB switch. Pressing and releasing the NB switch (to the out position) bypasses blanker operation.

2. INSTALLATION

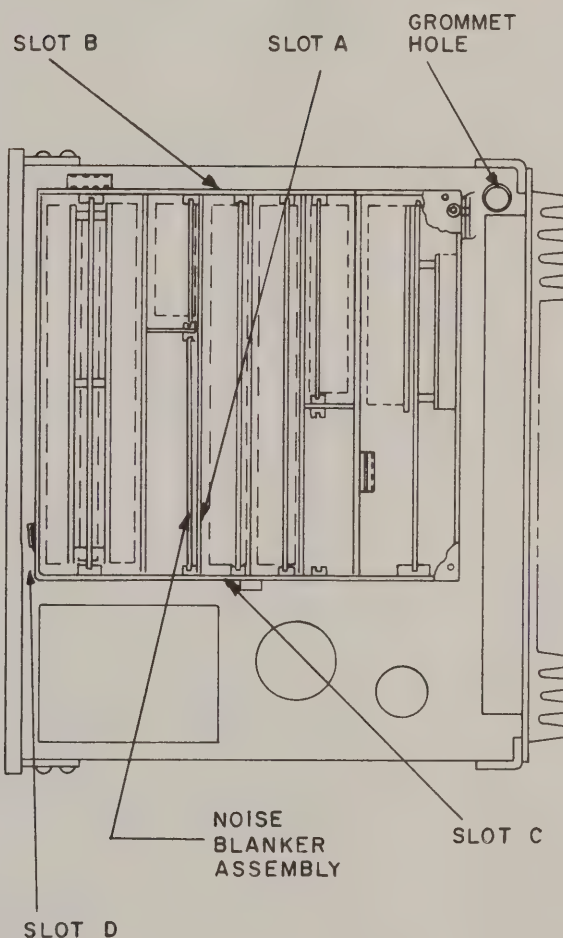
To install the noise blanker, perform the following:

- Remove the KWM-380 or HF-380 dust cover by removing four screws from the bottom of the transceiver.
- Remove card cage cover to expose plug-in circuit cards.
- Refer to figure 1. Insert noise blanker card into compartment indicated.

Note

Refer to figures 1, 2, and 3 while performing steps d through g.

- Route noise blanker coax cables through slots A and B, and through the grommet hole.
- Route noise blanker ribbon cable through slots A, C, and D. Slot D is the space between front of chassis and rear of front panel.



TPA-2219-019

Transceiver Card Cage
Figure 1

- Turn the transceiver for access to the underside of the chassis. Remove the jumper between J4 and J5 on the receiver-exciter circuit card.

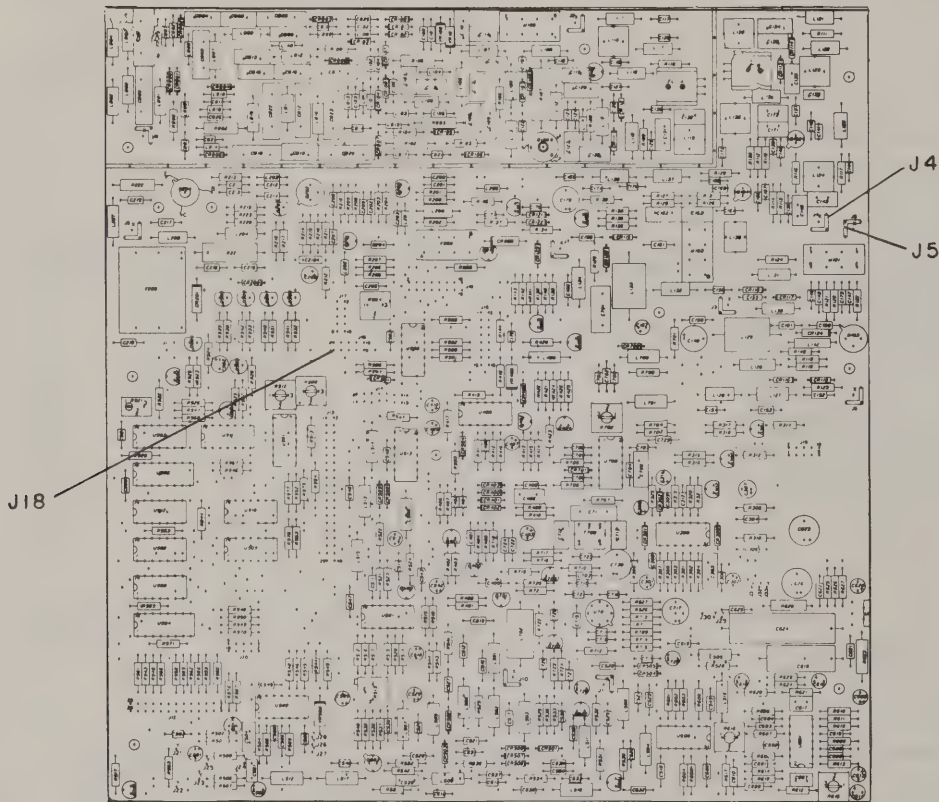
g. Connect noise blanker to receiver-exciter card as follows:

<u>FROM</u> <u>NOISE BLANKER</u>	<u>TO</u> <u>RECEIVER-EXCITER</u>
P1	J4
P2	J5
P18	J18

h. Reinstall card cage and dust covers.

3. PARTS LIST

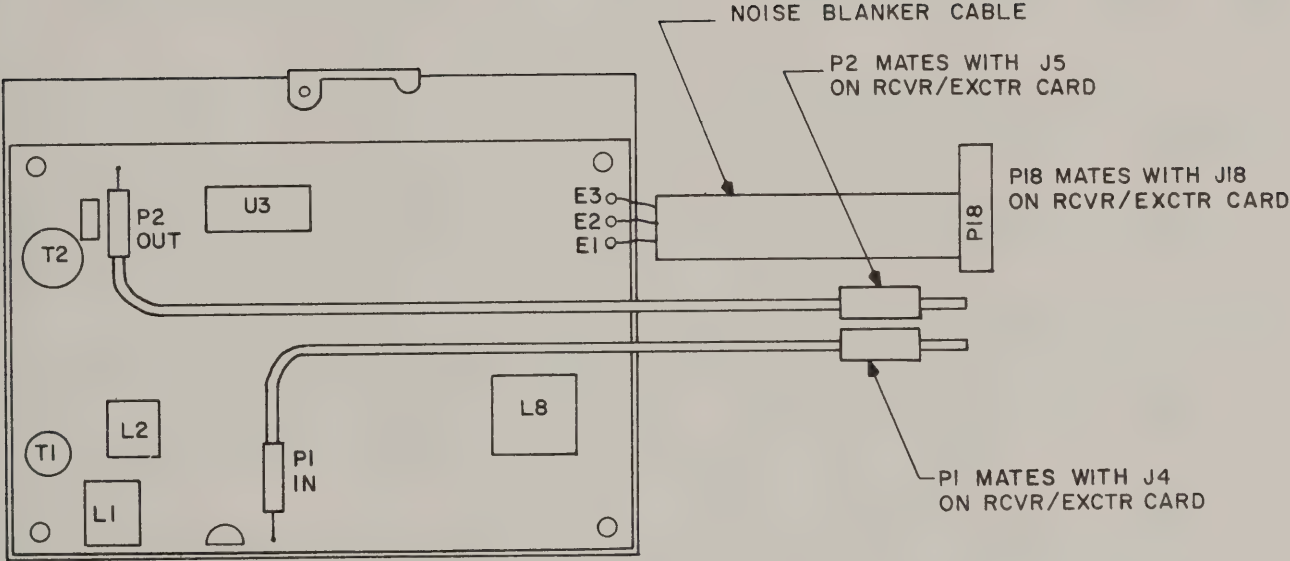
The instruction sheet and one noise blanker card, Collins part number 641-7146-001, are the only parts in the AC-3801 kit.



ALTHOUGH SOME COMPONENT LOCATIONS MAY DIFFER DUE TO
CIRCUIT BOARD CHANGES, LOCATIONS OF J4, J5, AND J18 ARE AS
SHOWN HERE.

TPA-2215-019

Receiver-Exciter Circuit Card
Figure 2



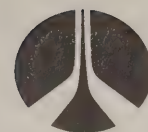
TPA-2211-011

Noise Blanker Circuit Card
Figure 3

Collins Telecommunications Products Division/Rockwell International
Cedar Rapids, Iowa 52406



TPA-2120-017



Rockwell
International

HF accessories

Collins AC-2818 Lightning Arrester

1. DESCRIPTION

The AC-2818 Lightning Arrester, Collins part number 622-3561-001, discharges to ground high-voltage current surges on the inner conductor of attached coaxial cables. Such surges can be produced by direct or nearby lightning strikes.

The AC-2818 is designed for insertion in 52- to 72- Ω coaxial cable and operates at frequencies up to 300 MHz with minimum insertion loss. Surrounding the arrester is an integral bulkhead mounting plate. The coaxial fittings are type SO-239 for mating with type PL-259 connectors.

An earth ground is required for the AC-2818. The AC-2819 Grounding Kit is recommended.

2. INSTALLATION

Note

The lightning arrester should be replaced when the resistance between the center conductor and outer case is 10 M Ω or less.

Perform the following for installation of the lightning arrester.

- a. Refer to figure 1 for dimensions and cut an opening in the wall through which the arrester is to be installed.

Note

It is recommended that the arrester be mounted through a metal plate approximately 150 x 150 mm (6 x 6 in) by 1.5 mm (0.06 in) thick.

- b. (1) If the recommended metal plate is used, secure the arrester to it with four machine screws, lockwashers, and nuts, or with four sheet-metal screws.
(2) Firmly secure the wire to the external grounding system (AC-2819 recommended) to the metal plate.
- c. (1) If the metal plate is not used, firmly secure the wire to the external grounding system (AC-2819 recommended) to one corner of the arrester with a machine screw, flat washer, lockwasher, and nut.
(2) Secure the arrester to the wall with appropriate fasteners through the other three holes in the arrester mounting flange.
- d. Connect the outside rf cable (from an associated antenna coupler or antenna) to the arrester coaxial connector.
- e. Weatherproof the outside part of the arrester and coaxial cable connection by covering with sealant such as silicon rubber (Dow-Corning RTV 140, for example) or spraying with an aerosol-propelled lacquer.
- f. Connect the rf cable from the associated transceiver to the inside connector of the connector.
- g. Make sure the grounding system to which the arrester is connected is an earth ground. (Instructions are supplied with the AC-2819 Grounding Kit for installing such a ground system.)

3. PARTS LIST

The instruction sheet and one lightning arrester, Collins part number 013-1268-010, are the only parts in the AC-2818 kit.

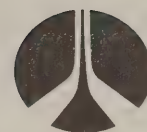


AC-2818 Lightning Arrester Dimensions
Figure 1

6-1-79



TPA-2120-017



Rockwell
International

HF accessories

Collins AC-2818 Lightning Arrester

1. DESCRIPTION

The AC-2818 Lightning Arrester, Collins part number 622-3561-001, discharges to ground high-voltage current surges on the inner conductor of attached coaxial cables. Such surges can be produced by direct or nearby lightning strikes.

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An earth ground is required for the AC-2818. The AC-2819 Grounding Kit is recommended.

2. INSTALLATION

Note

The lightning arrester should be replaced when the resistance between the center conductor and outer case is 10 M Ω or less.

Perform the following for installation of the lightning arrester.

- a. Refer to figure 1 for dimensions and cut an opening in the wall through which the arrester is to be installed.

Note

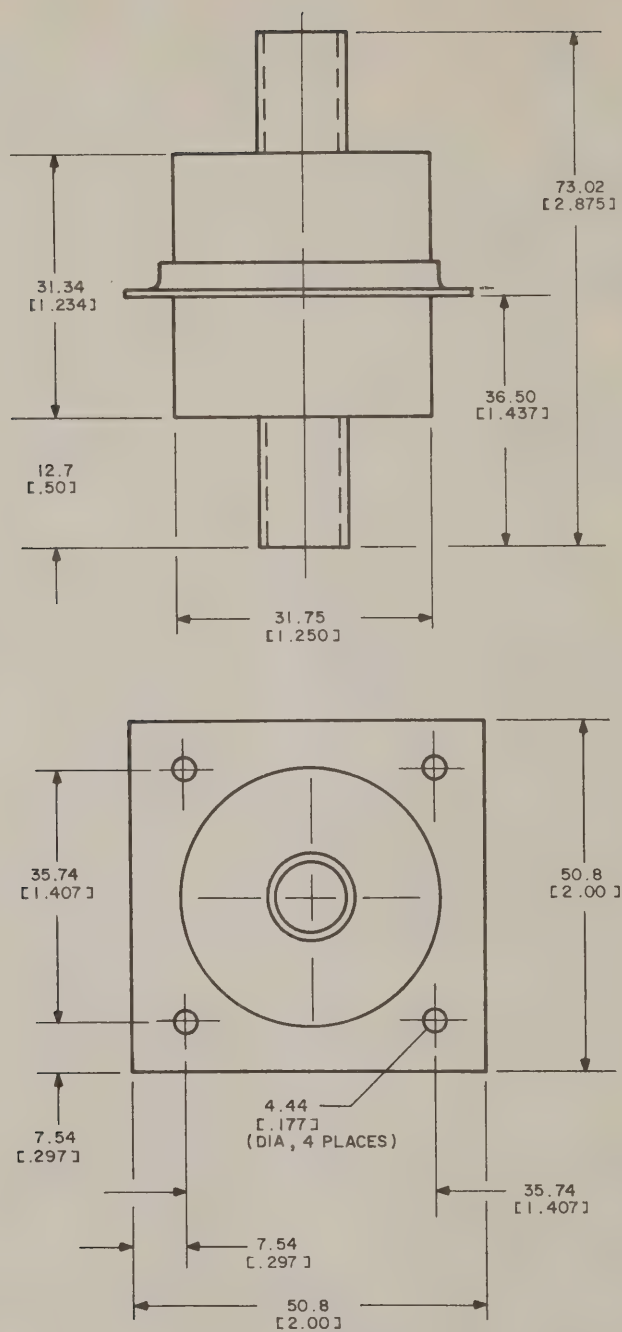
It is recommended that the arrester be mounted through a metal plate approximately 150 x 150 mm (6 x 6 in) by 1.5 mm (0.06 in) thick.

- b. (1) If the recommended metal plate is used, secure the arrester to it with four machine screws, lockwashers, and nuts, or with four sheet-metal screws.
(2) Firmly secure the wire to the external grounding system (AC-2819 recommended) to the metal plate.
- c. (1) If the metal plate is not used, firmly secure the wire to the external grounding system (AC-2819 recommended) to one corner of the arrester with a machine screw, flat washer, lockwasher, and nut.
(2) Secure the arrester to the wall with appropriate fasteners through the other three holes in the arrester mounting flange.
- d. Connect the outside rf cable (from an associated antenna coupler or antenna) to the arrester coaxial connector.
- e. Weatherproof the outside part of the arrester and coaxial cable connection by covering with sealant such as silicon rubber (Dow-Corning RTV 140, for example) or spraying with an aerosol-propelled lacquer.
- f. Connect the rf cable from the associated transceiver to the inside connector of the connector.
- g. Make sure the grounding system to which the arrester is connected is an earth ground. (Instructions are supplied with the AC-2819 Grounding Kit for installing such a ground system.)

3. PARTS LIST

The instruction sheet and one lightning arrester, Collins part number 013-1268-010, are the only parts in the AC-2818 kit.

AC-2818 lightning arrester



NOTE: DIMENSIONS ARE IN MILLIMETRES [INCHES]:

TPA - 1333 - 011

*AC-2818 Lightning Arrester Dimensions
Figure 1*

Collins Telecommunications Products Division/Rockwell International
Cedar Rapids, Iowa 52406

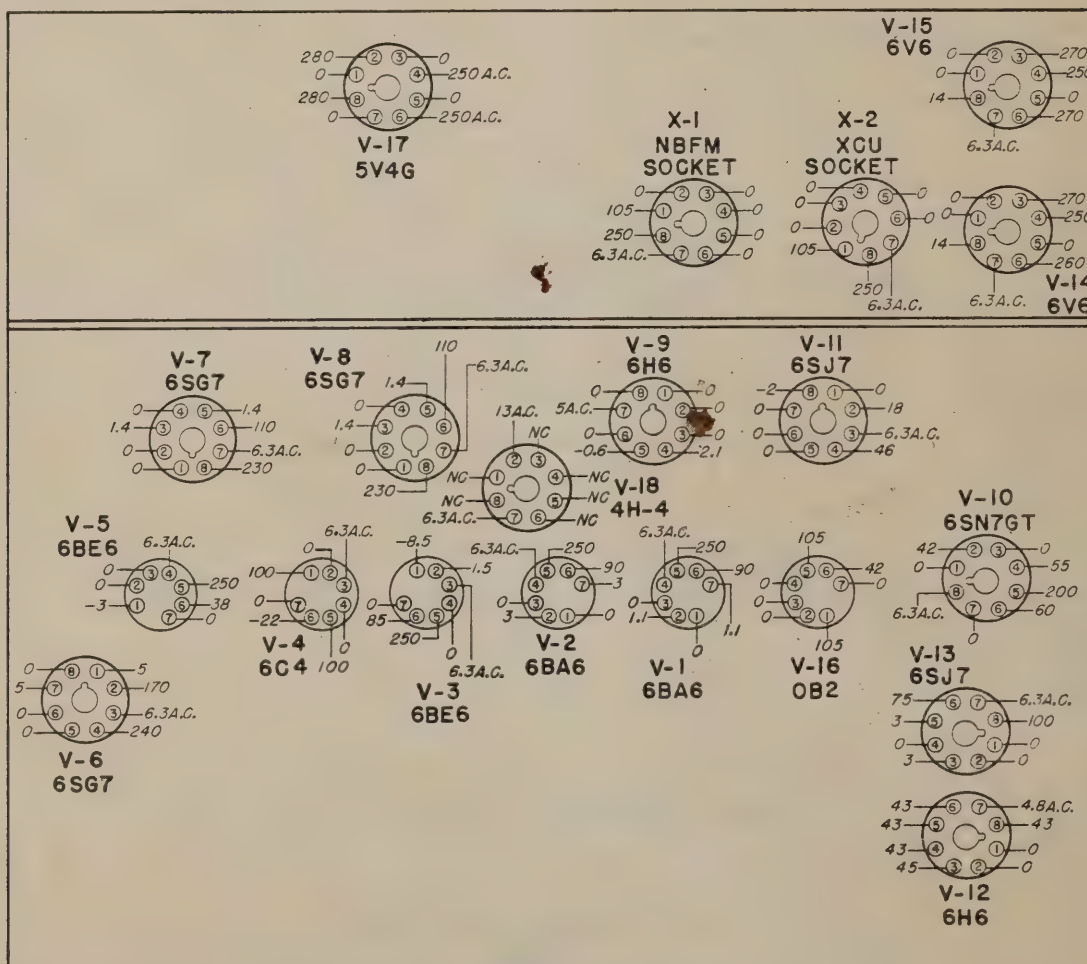


Return the generator connection to the mixer grid. Reset the generator to 2010 kc. and vary the frequency control between 2007 and 2013 until the peak is obtained on the output meter. Adjust the generator output to obtain 1 watt output across the 500-ohm terminals. The output of the signal generator should show a reading of 40 to 60 microvolts.

Replace the pivot screw making certain that it does not bind the switch arm. Remove and replace the coil set to determine that the switch is operating properly.

5-4. VOLTAGE TABULATION

All voltage measurements should be made using a high-impedance vacuum tube voltmeter. Readings taken with any other type of instrument will differ somewhat depending upon the input resistance of the meter. Voltmeter resistance should be ten times larger than the resistance of the circuit across which the voltage is measured otherwise the voltmeter will indicate a voltage lower than the actual voltage present. The tube socket voltage tabulations contained in Figure Number 8 were taken using a vacuum tube voltmeter with an input resistance of 11 megohms. All voltages are measured between specified socket terminals and chassis. The control settings to be observed are shown on Figure Number 8.

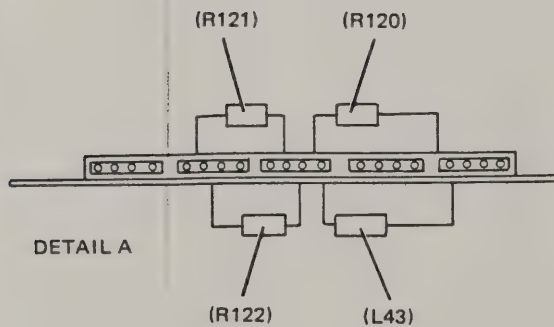
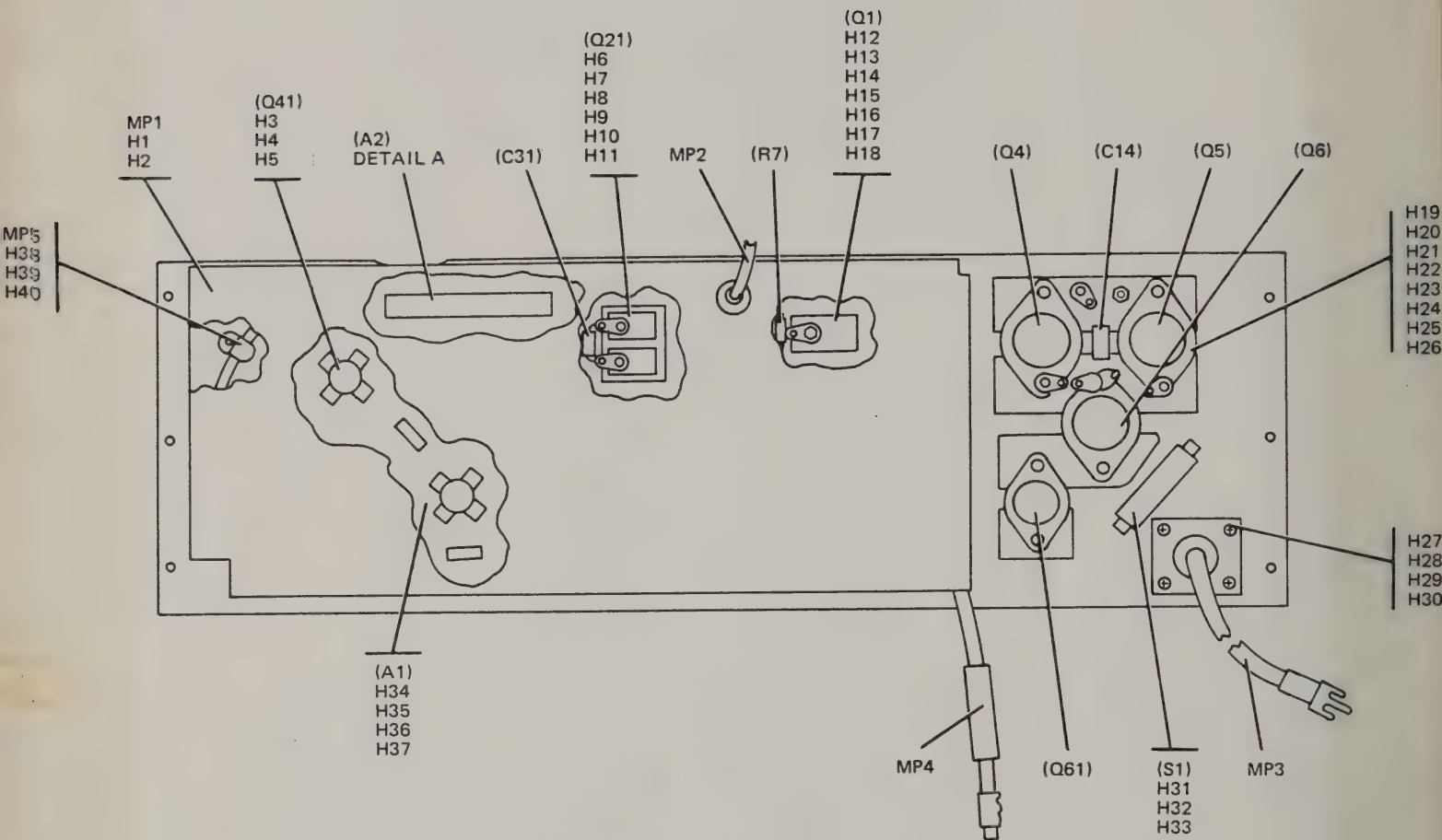


FRONT

Figure No. 8. Tube Socket Voltages

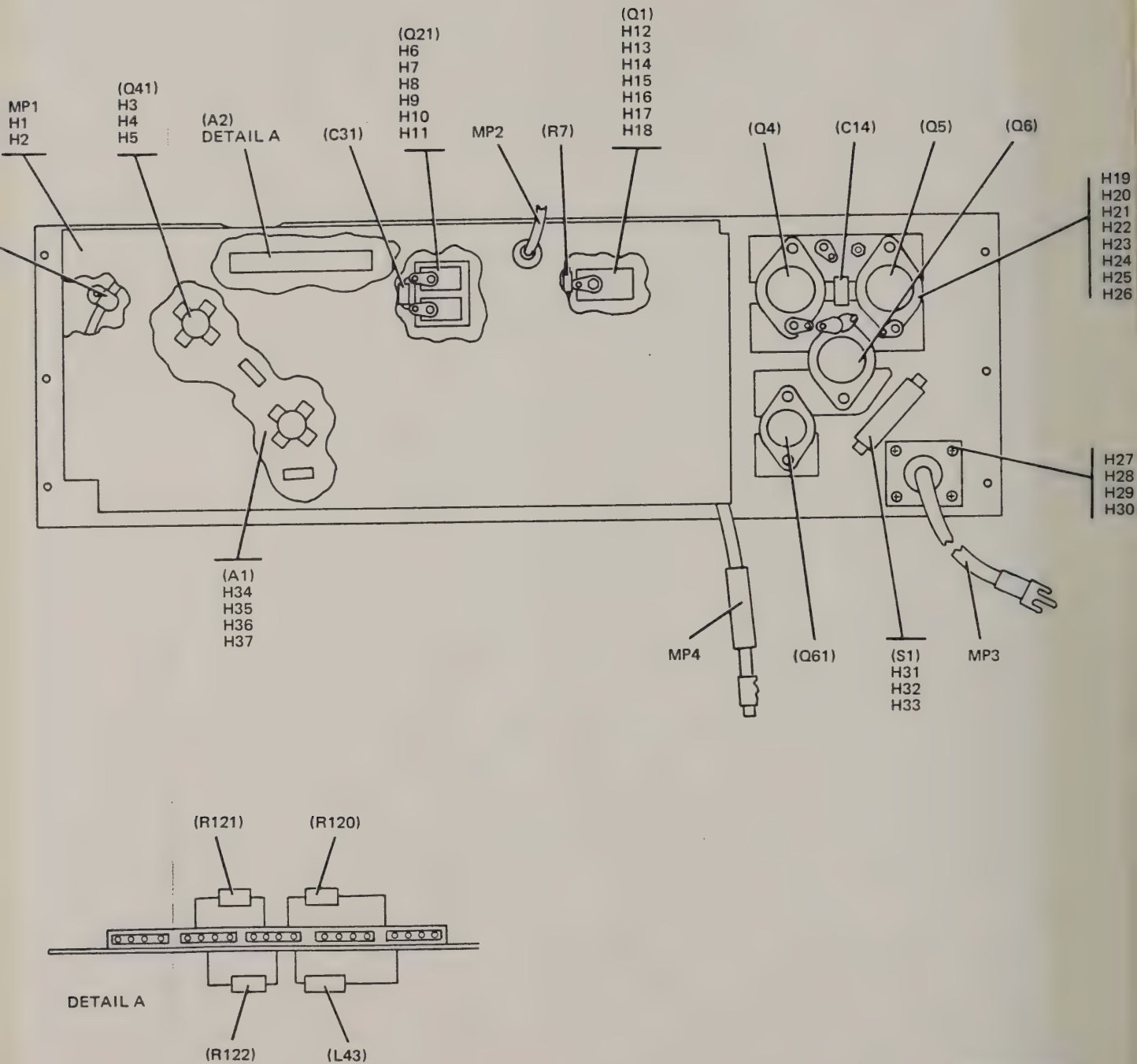
5-5. MAIN TUNING DIAL

The main tuning dial should normally give no trouble. If, however, the dial should become removed from the



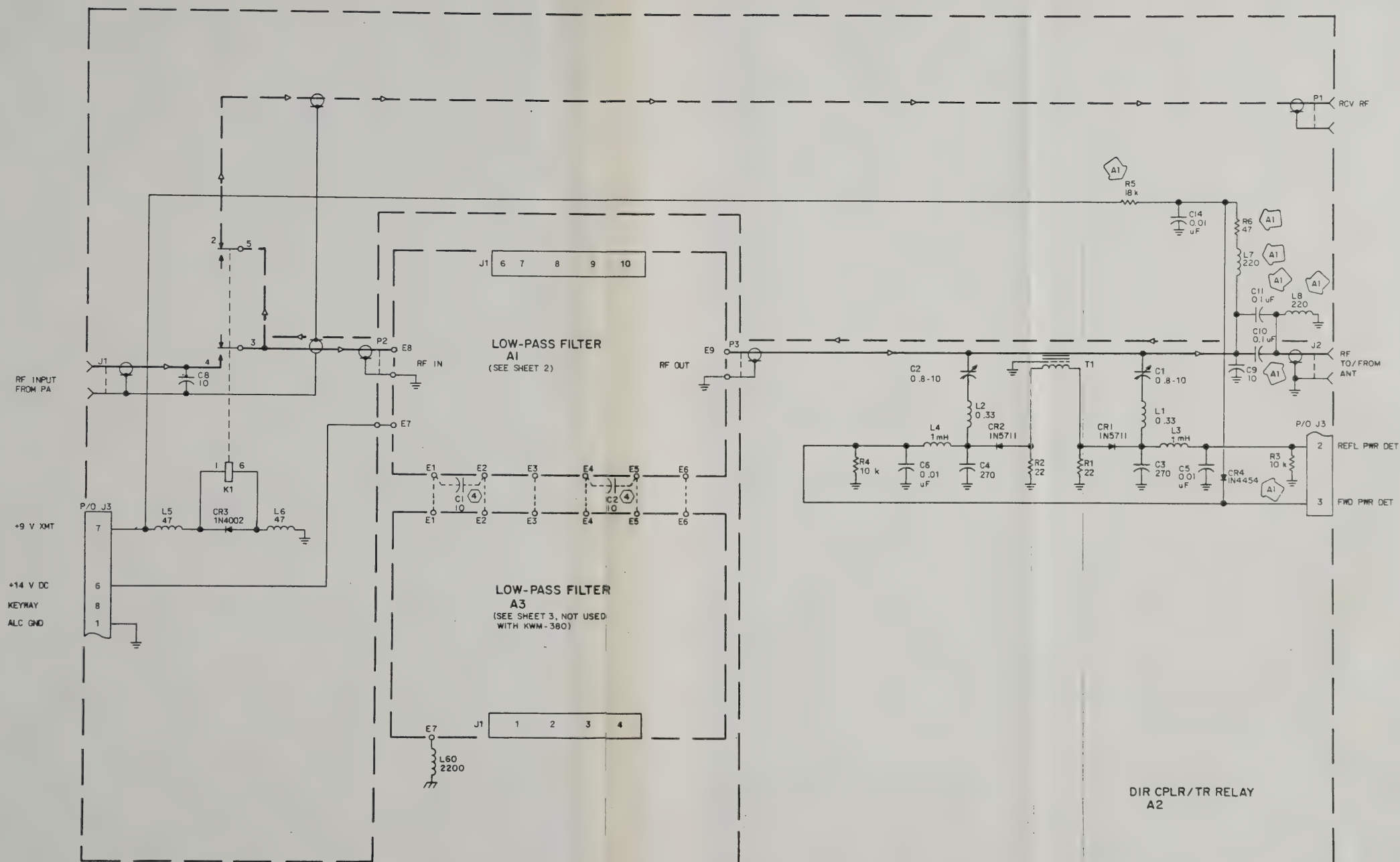
TPA-5290-028

Power Amplifier, Parts Location
Figure 3 (Sheet 1 of 3)



TPA-5290-028

Power Amplifier, Parts Location
Figure 3 (Sheet 1 of 3)



Low-Pass Filter, Schematic Diagram
Figure 3 (Sheet 1 of 3)

Table 2. Power Amplifier Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
3. (Cont)	low-pass filter. Measure ALC voltage at A1J3-18.	+1.0 $\pm$ 0.3 V	Adjust A1R106 as required. Check A1U101A, A1U101C, and A1U81B.
4. Current limit ALC	Switch out MOX. Caution In performing this test, do not overdrive the power amplifier. Excessive heating and component damage can result. - Turn off transceiver POWER switch. Disconnect A1J1 and J2 from +14-V high current input. - Disconnect A1P2 from low-pass filter and short P2. Connect voltmeter to ALC output A1J3-18. - Connect A1J1 and J2 to power supply adjusted for +14 V and current limited for 26 A. Include ammeter in circuit for measuring input current. - Reduce signal generator output level to near zero. Turn on transceiver power. Caution Step e must be performed in approx 15 seconds to prevent output transistors from overheating. If RT101 in the ALC thermal limiting circuit (A1U101C) is overheated, the current limit ALC (A1U101D) adjustment will be in error. - While watching high-current ammeter, switch in MOX and increase signal generator output level until current is 24 $\pm$0.5 A. Let current stabilize approx two seconds; then measure ALC voltage (A1J3-18). - Switch out MOX. Turn off transceiver power. Remove short from A1P2 and reconnect P2 to low-pass filter. Disconnect power supply and reconnect A1J1 and J2 to transceiver. Turn on power.	+1.0 to +2.0 V dc	Adjust A1R45 as necessary.
5. Gain/frequency	Perform following steps at 3.99, 7.29, 14.34, and 29.69 MHz:		
(Cont)	Set signal generator to frequency and 0-V rf output.		

Table 2. Power Amplifier Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
5. (Cont)	b. Tune transceiver to proper frequency. c. Switch in MOX and increase signal generator output to produce 100-W output from transmitter. d. Note rf input voltage to amplifier from signal generator. e. Switch out MOX.	0.6 to 2.3 V rf (as indicated on signal generator)	Check Q1, Q21A/B, and Q41A/B for low gain.
6. Tune power	a. Set signal generator and transceiver frequency to 3.9 MHz. b. Ground A1J3-8. c. Switch in MOX and adjust signal generator output level for 20- to 30-W transmitter output. d. Measure ALC voltage at A1J3-18 or J16-6. e. Switch out MOX and remove ground from A1J3-8.	+1.5 $\pm$ 0.5 V	Check A1Q81, A1Q82, A1U81B, A1U101A, A1Q3 and A1Q4.
7. Average power ALC	a. Remove ground from A1J3-17 or remove jumper from between ALC INHIBIT terminals on receiver-exciter, installed in step 3.a. b. Set signal generator output to 1.5 V; switch in MOX and note time required for transmitter to go to reduced power. Note If AC-2808 Blower has been installed, ALC INHIBIT signal has been disabled and amplifier will not automatically reduce power output level.	10 to 30 seconds (rf output should be 50 to 60 W)	Check A1U81A, A1C85, and A1Q83.
8. Intermodulation distortion	a. Inhibit average power ALC by grounding A1J3-17 or by jumpering ALC INHIBIT terminals on the receiver-exciter. b. Connect spectrum analyzer to rf output through variable signal sampler and 20-dB attenuator. c. Connect second signal generator to rf input through power divider. Insert 6-dB of attenuation in rf output of signal generators.		
(Cont)			

Table 2. Power Amplifier Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
8. (Cont)	d. Tune transceiver to 22 MHz. Drive power amplifier with single tone at 22 MHz to obtain 95 $\pm$1-watt output. Adjust ALC REF adjust A1R106 to obtain 1.0 $\pm$0.3-V dc ALC output measured at A1J3-18. e. Remove ground from A1J3-17 or remove jumper from between ALC INHIBIT terminals on receiver-exciter. f. Drive power amplifier from two-tone source with equal tones spaced 600 $\pm$100 Hz at frequencies listed below to obtain ALC voltage of 1.0 $\pm$0.3 V dc measured at A1J3-18. g. Switch out MOX; turn off power; and disconnect test equipment.	3rd and 5th order products NLT -25 dB below either tone	Check Q41A/B and associated circuit.

4. REPAIR

Repair of the power amplifier is accomplished using standard maintenance and circuit card repair procedures.

5. PARTS LIST/DIAGRAMS

5.1 Introduction

This paragraph assists in identification and requisition of parts. A parts location illustration, schematic diagram, parts list tabulation, and modification history are included. The parts location illustration is a design engineering drawing that shows exact component placement on the circuit cards.

Use the reference designator indicated on the schematic and parts location diagram to locate parts in the parts list tabulation. The description, Collins part number, usable on code, manufacturer's code and manufacturer's part number are listed for each reference designator.

5.2 Parts List

REF DES Column — Reference designators of each part/subassembly are listed in alphanumeric sequence. These are the reference designators shown on the parts location drawing and schematic diagram.

DESCRIPTION Column — Lists the noun name, modifier, descriptive information, and modification.

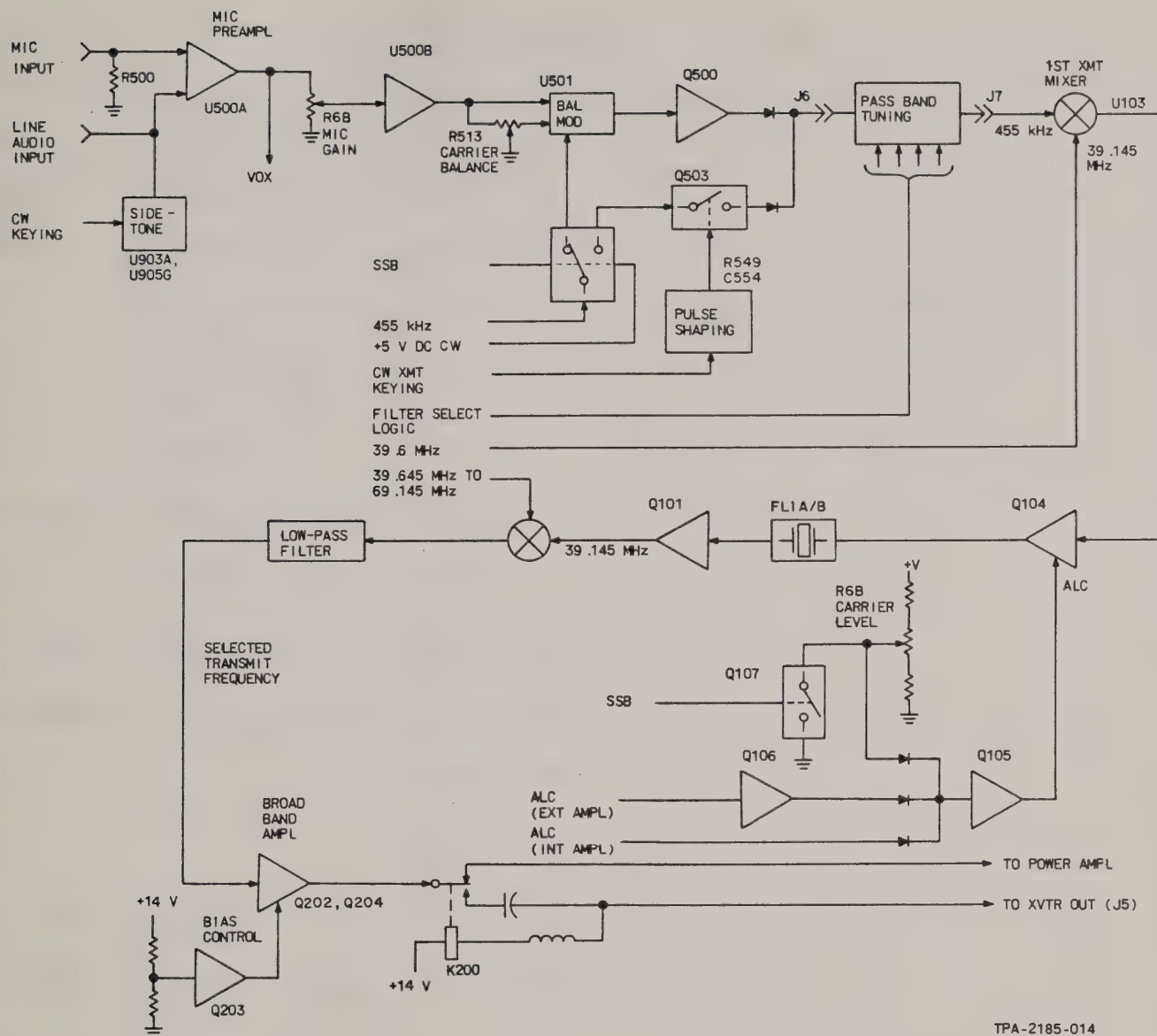
Modifications are identified by an alphanumeric identifier assigned to each design change. These identifiers are referenced in the DESCRIPTION column of the parts list in parentheses and on the schematic diagram inside an arrow that points to the change. Each change relates to the revision identifier (REV) stamped on the circuit card/subassembly and is listed in the EFFECTIVITY column of the modification history. NA (not applicable) in the REVISION IDENT column indicates a documentation change only. The change does not affect the circuit card/subassembly components.

COLLINS PART NUMBER Column — Lists the Collins part number for each item in the parts list.

USABLE ON CODE Column — Part variations within a group of equipment are indicated by a letter code (A, B, C, etc). Absence of a code indicates part applies to all models.

MFR CODE Column — Lists the manufacturer's code from which selected parts can be procured.

MFR PART NUMBER Column — Lists the manufacturer's part number for the selected parts.



Transmit Signal Path

Figure 8

The microphone/preamplifier output is applied to the VOX circuit (discussed in paragraph 2.3.2) and to the front-panel MIC gain portion of potentiometer R6B. The audio signal tapped by the potentiometer is applied to amplifier U500B.

The audio output from the amplifier is applied to balanced modulator U501. This is the modulating signal for the 455-kHz input to the balanced modulator. The 455-kHz signal is input from J10 through

forward-biased CR500 (by +9 V DC XMT) and forward-biased CR502 (by SSB). Potentiometer R513 is adjusted for minimum rf carrier output from the exciter when there is no audio input. If the transceiver is not in a sideband mode, CR502 will be reverse-biased. This keeps the 455-kHz signal from U501 and no output is produced. Thus, if the operating mode is CW, an audio output will not affect the output signal.

Table 1. Test Equipment Required.

ITEM	USED FOR	SUGGESTED TYPE	MINIMUM SPECIFICATIONS
Signal generator (2 required)	Rf input to power amplifier	Hewlett-Packard 8640B	1.6 to 30 MHz, 0- to 3-V rf output
Wattmeter	Measuring power output	Bird 43 with 250H element	0 to 120 W
Rf load	Terminating amplifier rf output	Bird 8135	50 ohms; 150 watts, continuous; 1.6 to 30 MHz
CW key	Keying transceiver to enable power amplifier	AC-2827	Continuously-closed switch provision
Dc voltmeter	Measuring amplifier voltages	Fluke 8000A	0 to 30 V; provision for isolating from ground
Dc power supply	Supplying high current for current limit test	Sorensen SRL-20-25	0 to 25 A, 13.5 V
Dc ammeter	Measuring amplifier high-current input	Yew 2051	0 to 250 mA, 0 to 25 A
Dc power supply	Biassing transmit monitor circuit	Hewlett-Packard 6264B	9 V, 10 mA
Spectrum analyzer	Measuring intermodulation distortion	Hewlett-Packard 141T	
Rf plug-in		Hewlett-Packard 8553B	
If plug-in		Hewlett-Packard 8552B	
Variable signal sampler	Connection of spectrum analyzer	Bird 4273-020	
Power divider	Connecting 2 signal generators as two-tone source	Weinschel 1506A	
6-dB attenuators (2 required)	Pad signal generator outputs	Weinschel 1A6	
20-dB attenuator	Pad signal sampler to spectrum analyzer	Weinschel 9214	

3.2.1 Preliminary Setup

Do not apply power to the equipment until instructed to do so in the procedures. Do not connect power with power switches turned on.

Connect the equipment as instructed in the procedures for each test.

3.2.2 Test Procedures

Perform the tests as given in table 2.

The forward power detected signal is input to A1U81A, the average amplifier power sensor. The long time constant of capacitor A1C85 and A1R89 causes the output of A1U81A to average the pa forward power output analog. When in CW or RTTY mode, the average power output is limited to 60 watts by the AVG ALC INHIBIT signal input to Q83. The amplifier will operate at full power for approximately 10 to 30 seconds before the ALC automatically reduces the power to a 60-watt average. For test purposes, or for continuous full-power operation with the AC-2808 Blower installed, the AVG ALC INHIBIT signal can be grounded. This keeps the ALC from reducing average power.

The forward power detected signal is also input to A1U81B, the peak amplifier power sensor. The normal gain of A1U81B can be changed to decrease the pa output to approximately 20 watts. A logic 0 on the tune power input will do this. With tune power at logic 0, ALC gain switch A1Q81 is off and A1Q82 conducts to parallel A1R95 with A1R81. This increases the gain of ALC amplifier A1U81B. With increased gain, A1U81B requires a lower value of the forward power detected input signal to develop the normal ALC signal at A1J3-18. The output from A1U81B is applied to the ALC summing point, power meter, and transmit monitor switch A1Q101. The transmit monitor signal goes to logic 0 when the pa output is greater than approximately 50 watts.

The reflected power detected voltage is monitored by A1U81C and applied to the ALC summing junction. Current sense amplifier A1U101D compares the voltage at A1R43 (due to the collector currents of Q41A/B) with a reference voltage. The reference voltage is set by A4R45 to cause ALC current limiting when the +14-V dc high-current input reaches 23 amperes.

The current sense amplifier, peak power amplifier, average power amplifier, and reflected power amplifier outputs are all applied to the ALC summing junction at the noninverting input of A1U101A. This signal is compared to the ALC reference voltage from A1R106. The ALC threshold is adjusted for nominal output from A1U101A of 1.5 V with 100 watts of rf output power.

The voltage across A1R106 is developed by A1U101C, a thermal sense circuit controlled by thermistor RT101. (The thermistor is in contact with the heat sink.) Overheating causes the ALC to reduce the pa output power to a safe level, usually about 18 watts, to avoid damage.

3. TESTING/TROUBLESHOOTING PROCEDURES

Warning

This device contains a radio frequency transmitter which, when operated into an antenna, may produce electromagnetic fields in close proximity to the antenna that are in excess of Occupational Safety and Health Administration (OSHA) recommended maximum limits.

Caution

Do not operate the power amplifier subassembly alone (without the directional coupler) without a 50-ohm load attached. Amplifier components may be damaged.

Do not overdrive the power amplifier. This can cause excessive heating and destruction of bypass capacitors.

A performance test for the power amplifier is given in table 2. In addition to the required performance criteria, troubleshooting comments are given.

It is assumed that the repair technician is trained in solid-state circuit troubleshooting and repair techniques, and is familiar with the test equipment to be used. Step-by-step operating procedures are not given in the tests and not all possible troubleshooting information can be listed. The tests in table 2 must be performed in sequence.

Testing and troubleshooting of the power amplifier requires the power amplifier be installed in the transceiver.

3.1 Test Equipment Required

Table 1 lists the equipment required to perform the tests. A suggested type is given; however, that specific equipment is not required. Any that meets or exceeds the indicated minimum specifications is acceptable for use.

3.2 Performance Test

The following test procedures measure the performance of the power amplifier. After being repaired, repeat the numbered test where repair was performed to verify that no further malfunctions exist.

2. PRINCIPLES OF OPERATION (Refer to block diagram, figure 2, and schematic diagram, figure 4)

An automatic level controlled 10- to 100-mW rf signal (depending on frequency and ALC signal level) is input from the receiver-exciter to predriver amplifier Q1. When the transmitter is keyed, A1Q2 is turned on by the +9-V XMT voltage. This lets +14 V be applied to bias networks A1R21/R22/CR1 and A1U101B. The amplified output from Q1 is applied to the driver stage, Q21A/B. Here, it is further amplified and applied to the final amplifier stage, Q41A/B. The predriver operates as a class A amplifier; the driver and final stages operate class AB.

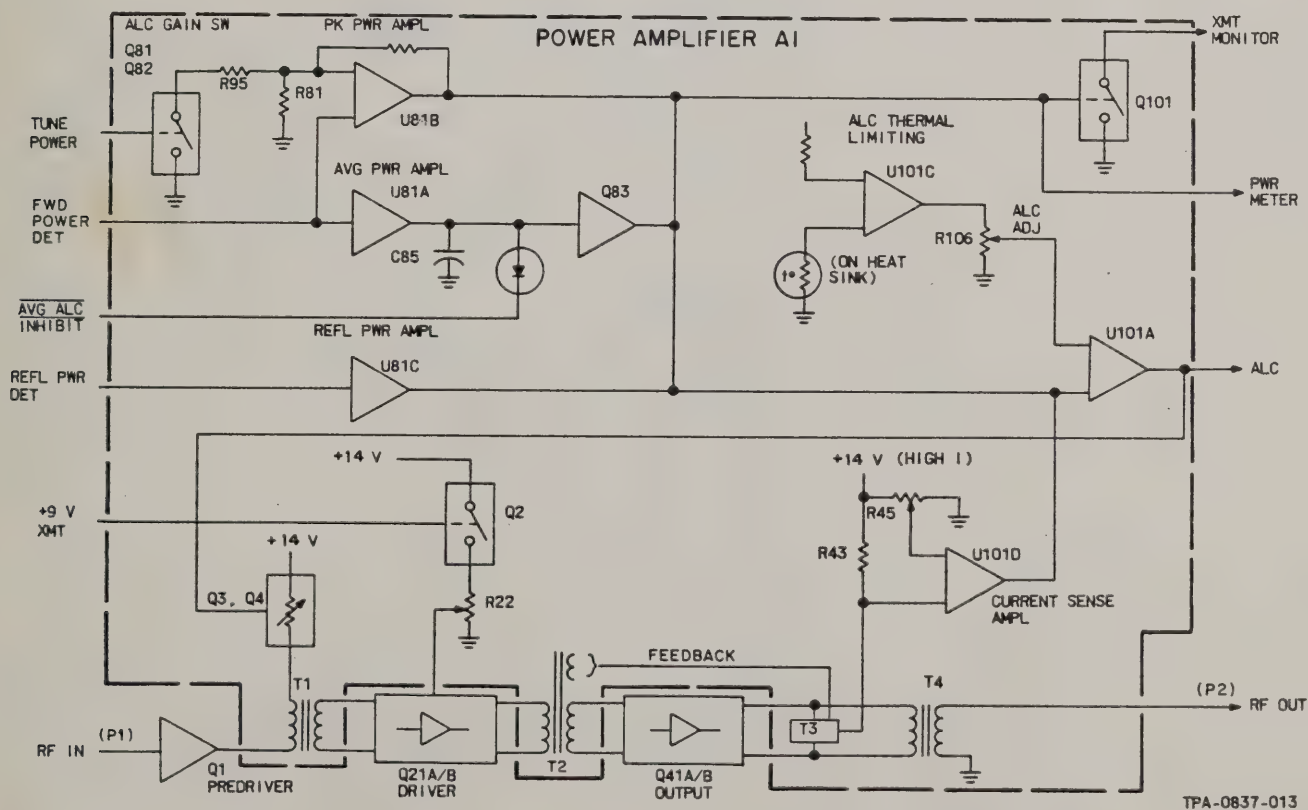
The output from Q41A/B is coupled across A1T4 at a nominal 50-ohm output impedance. Transformer A1T3 provides a dc path for the Q41A/B collectors while keeping rf from the power supply.

Idle collector current for the drivers is set by A1R22 to be approximately 250 mA, measured at 27 to 29 mV dc across A1R28 at TP2 and TP3. Idle collector

current for the final amplifiers is set by A1R63 to be 200 mA, measured in the +14-V dc high-current input line.

The ALC signal is derived from four sources: peak amplifier output, average amplifier output, reflected power, and final amplifier stage collector current. A temperature-sensing input from the heat sink will cause the ALC to limit the power amplifier output to lower levels if the heat-sink temperature exceeds 90 °C. The composite ALC signal is output from A1U101A.

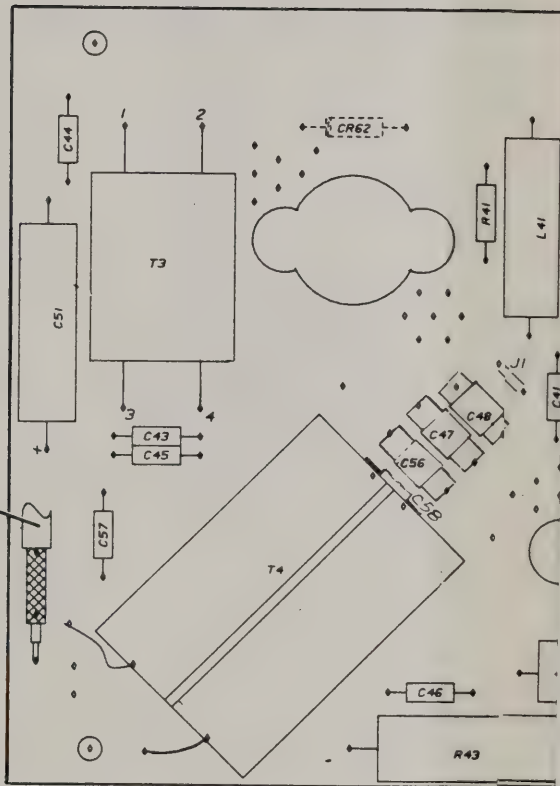
The ALC signal normally controls the exciter gain. If a malfunction occurs and the exciter output increases beyond normal, the A1U101A output will increase. When the output voltage reaches approximately +3.2 V, zener A1VR1 will conduct. This causes A1Q3 to begin conducting, reducing current through A1Q4. Since A1Q4 regulates the collector current of predriver Q1, the ALC signal will control the gain of the power amplifier directly. This is for fail-safe operation.

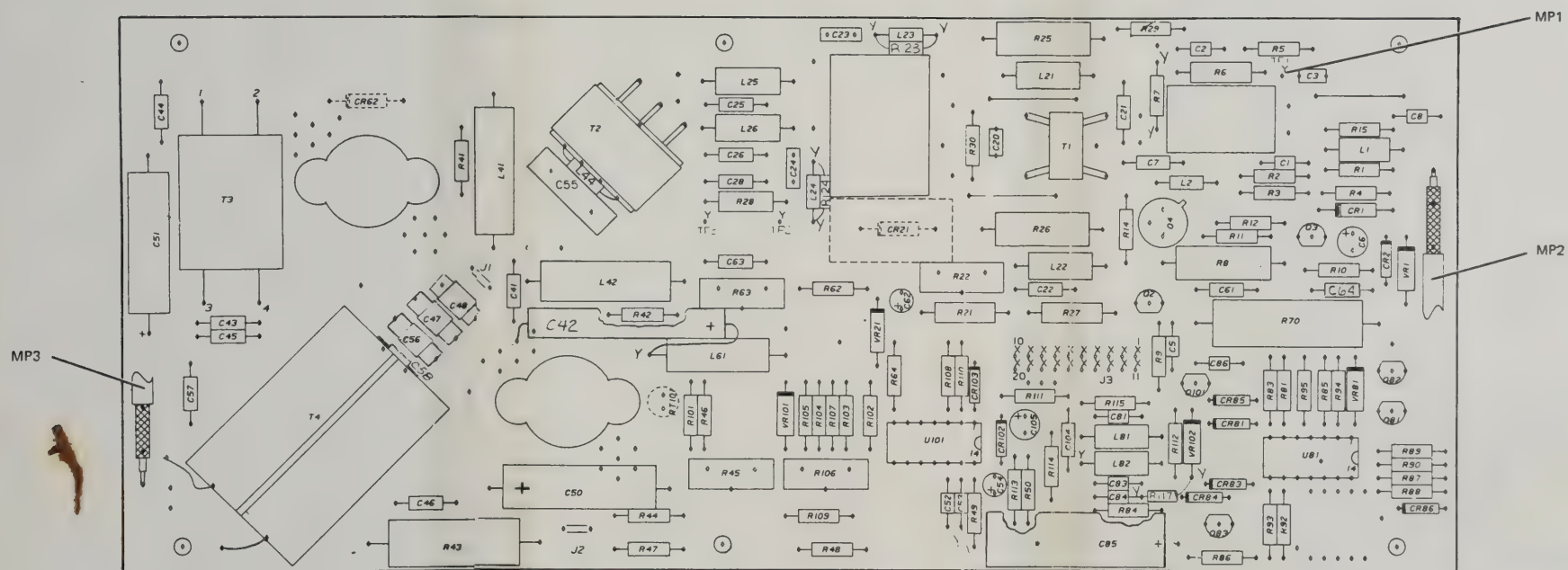


TPA-0837-013

Power Amplifier, Block Diagram
Figure 2

MP3





638-6775-001

TPA-5290-028

Power Amplifier, Parts Location
Figure 3 (Sheet 3)

PARTS LIST (Cont)

MFR CODE	MFR PART NUMBER	REF DES	DESCRIPTION	COLLINS PART NUMBER	USABLE ON CODE	MFR CODE	MFR PART NUMBER
1349	RCR076330KS	R120	RESISTOR,FXD CHPSN, 1K, 10%, 1/2W	745-1352-000		81349	RCR206102KS
1349	RCR076100KS	R121,	RESISTOR,FXD CHPSN, 47 OHMS, 10%, 1/2W	745-1296-000		81349	RCR206470KS
1349	RCR076560KS	R122					

MODIFICATION HISTORY

REVISION IDENT	DESCRIPTION OF REVISION AND REASON FOR CHANGE	EFFECTIVITY
	634-8481-003	
A1	A1A2 was added R7 resistor test select added	REV G
	638-6775-001	
A1	C85 changed from 150UF to 470UF C27 was deleted	REV M
A2	C29, C30 was deleted L23, L24 changed from .27UH to 3.30UH. L44 was added-240-2715-180 R23, R24 was deleted R93 changed from 7.15K to 44.2K R116 was deleted R117 was added-745-0770-000 R123, R124 was added-745-1310-000	REV N
A3	R21 changed from 47 ohms to 82 ohms	REV P
A4	R7 was deleted	REV R

1349 RCR206470KS
1349 RCR206820KS
1450 X201R101B
1121 EB20G5
1349 RCR32G560KS
1349 RCR20G390KS
1349 RM70UR110F
1349 RCR076680KS

1349 RCR076100KS
1637 RS5R010-1PCT
1349 RN55D0901F
1450 X201R251B
1349 RN55D1781F
1349 RN55D1002F
1349 RN55D2051F
1349 RCR076104KS
1349 RCR076102KS

1349 RCR076332KS
1450 X201R251B
1349 RCR076102KS

1349 RM67V100

1349 RN55D1002F

1349 RN55D04491F
1349 RCP076102KS
1349 RCR076223KS
1349 RCR076184KS
1349 RN55D1002F
1349 RCR076103KS
1349 RCR076683KS
1349 RN55D2742F

1349 RN55D1002F
1349 RN55D7151F
1349 RN55D4422F
1349 RCR076103KS
1349 RN55D3481F

1349 RN55D1002F

1349 RN55D6650F
1349 RN55D2262F
1349 RCR076471KS
1450 X201R102B
1349 RCR076392KS
1349 RCR076472KS
1349 RCR076681KS
1349 RCR076473KS
1349 RCR076102KS

1349 RCR076472KS

1349 RCR076392KS

1349 RCR206101KS

0031 5X1349103KX000F
0462 278-0439-013
0462 278-0439-020
0462 278-0439-030
0462 278-0439-040

4335 LM324M

4335 LM324M
4713 1M4610

4713 1M4733A

4713 1M4610

4713 1M4625
4713 1M4614

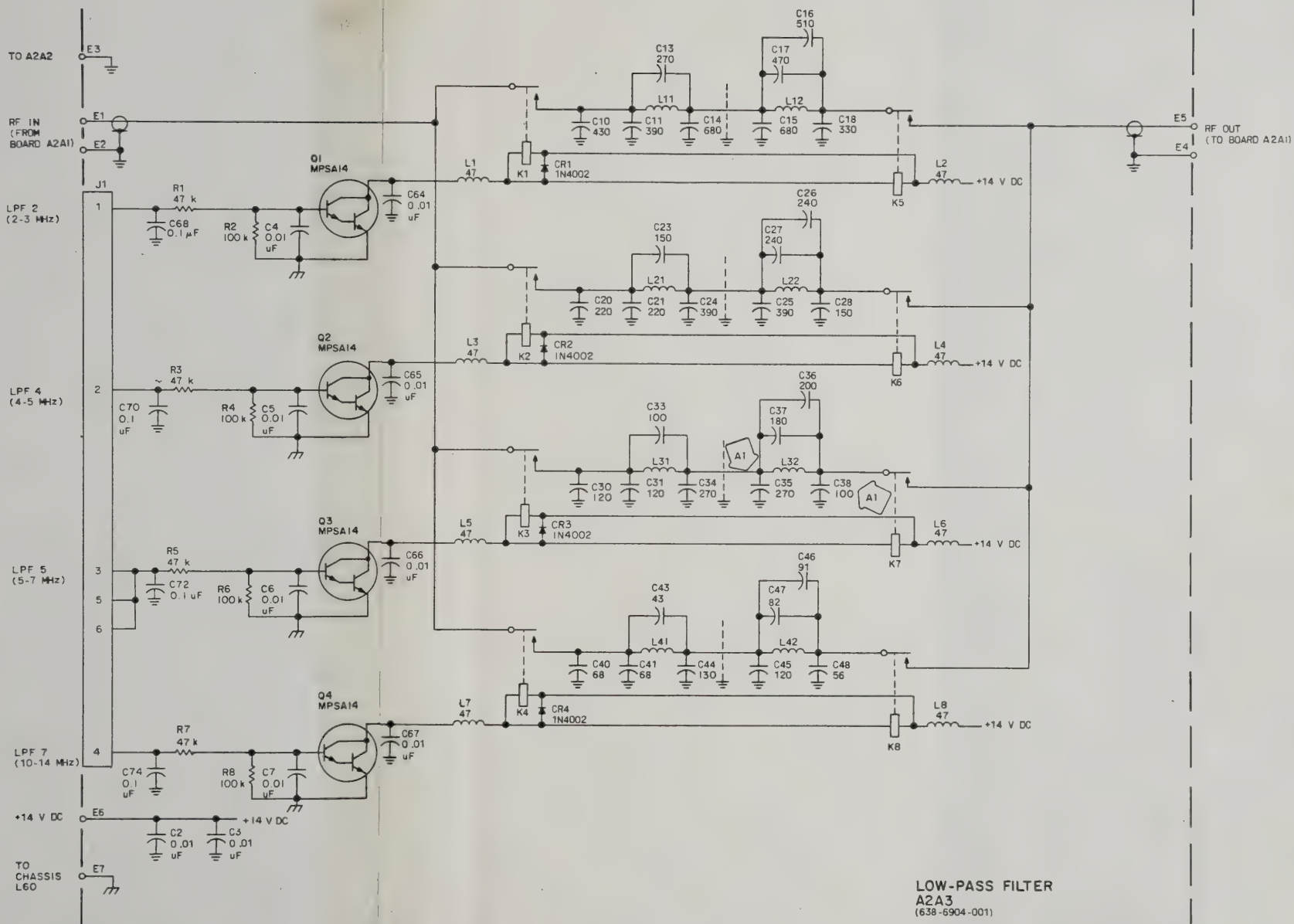
5906 MS75088-13

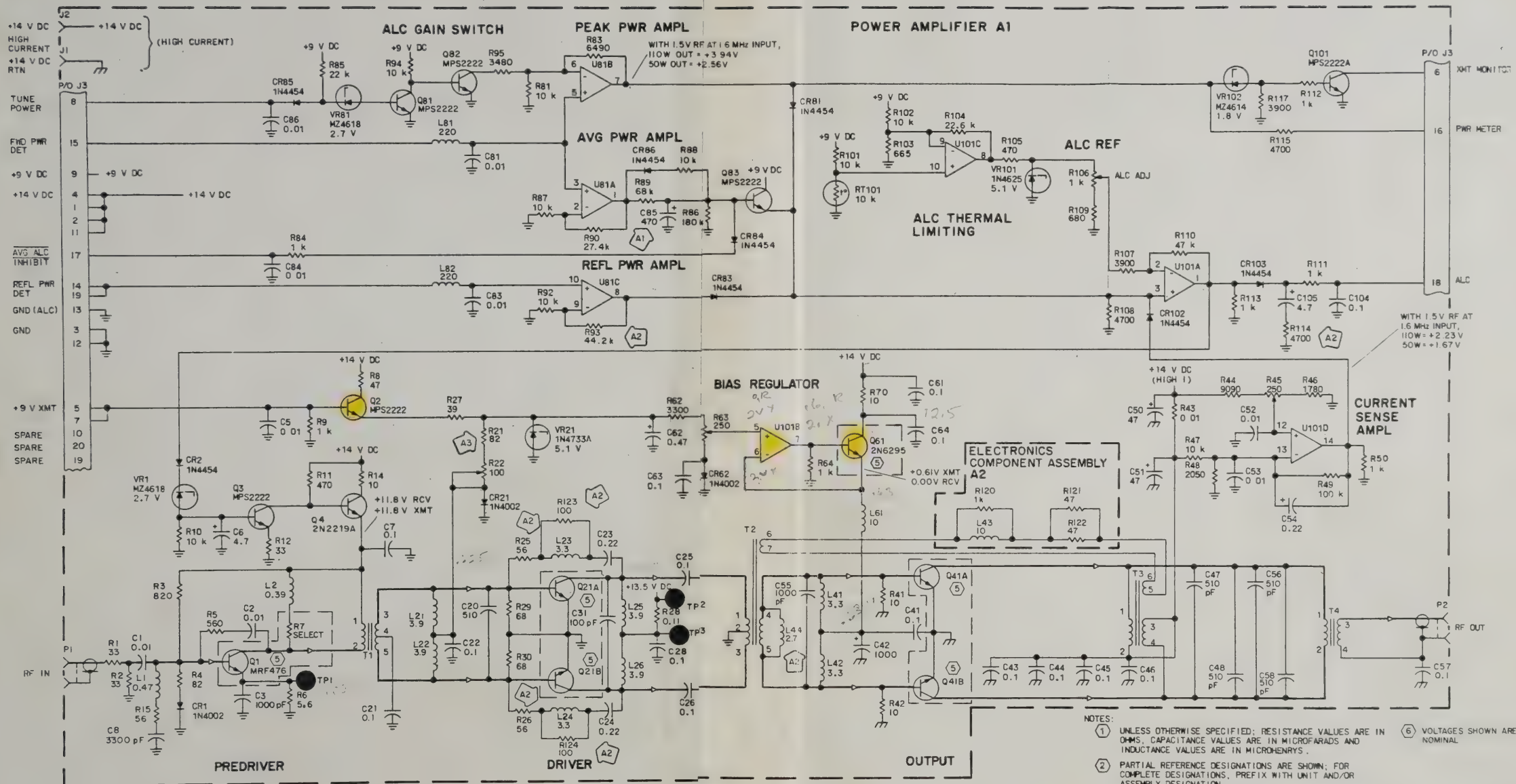


TO A2A2

RF IN
(FROM
BOARD A2A1)LPF 2
(2-3 MHz)LPF 4
(4-5 MHz)LPF 5
(5-7 MHz)LPF 7
(10-14 MHz)

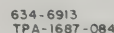
+14 V DC

TO
CHASSIS
L60RF OUT
(TO BOARD A2A1)LOW-PASS FILTER
A2A3
(638-6904-001)

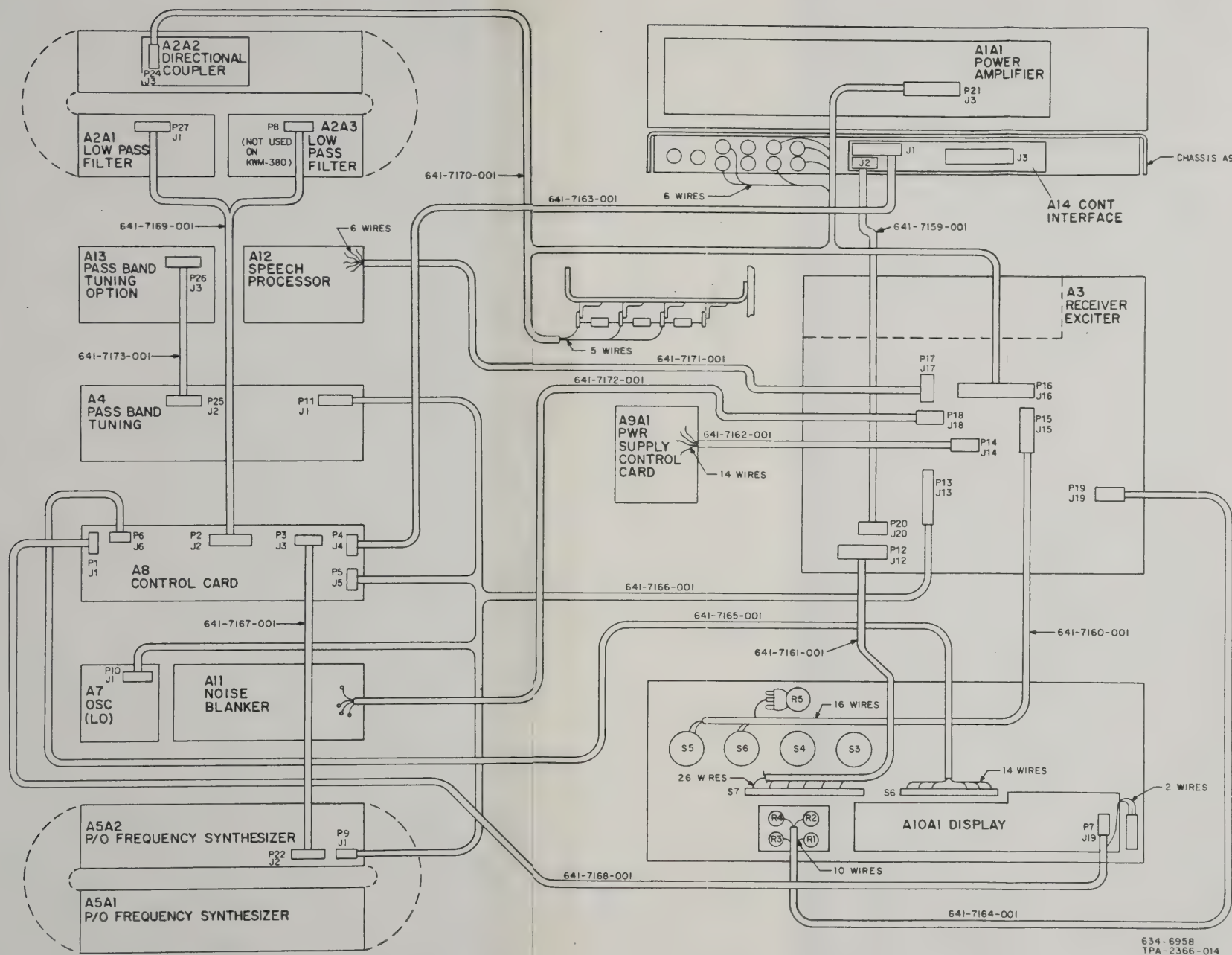


634-6647

Power Amplifier, Schematic Diagram
Figure 4



Receiver-Exciter, Schematic Diagram
Figure 11 (Sheet 2)



NOTE:
REFER TO PARTS LOCATION
DIAGRAMS FOR CONNECTOR
PIN LOCATIONS.

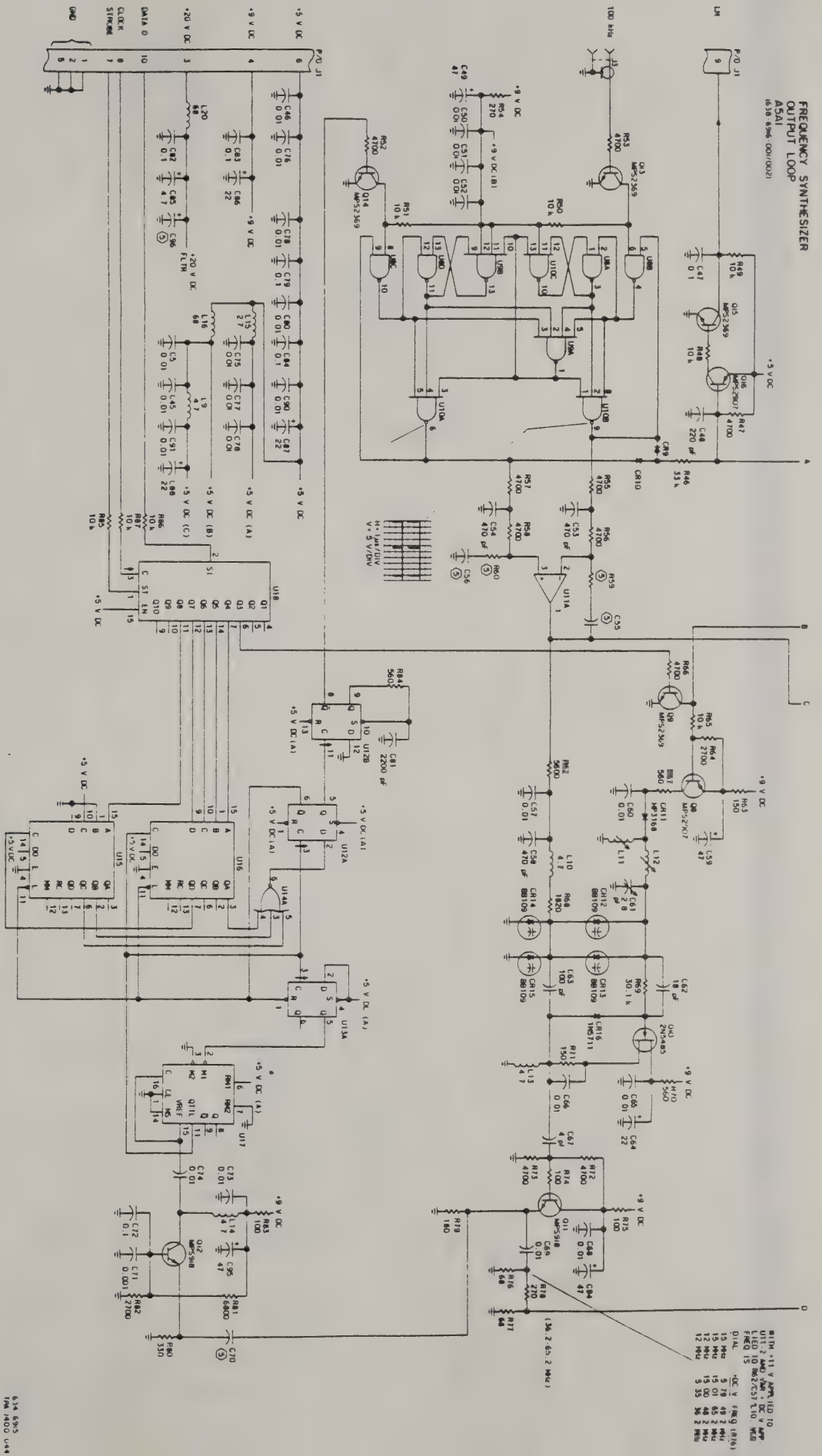
634-6958
TPA-2366-014

Ribbon Cable Wiring Diagram
Figure 1

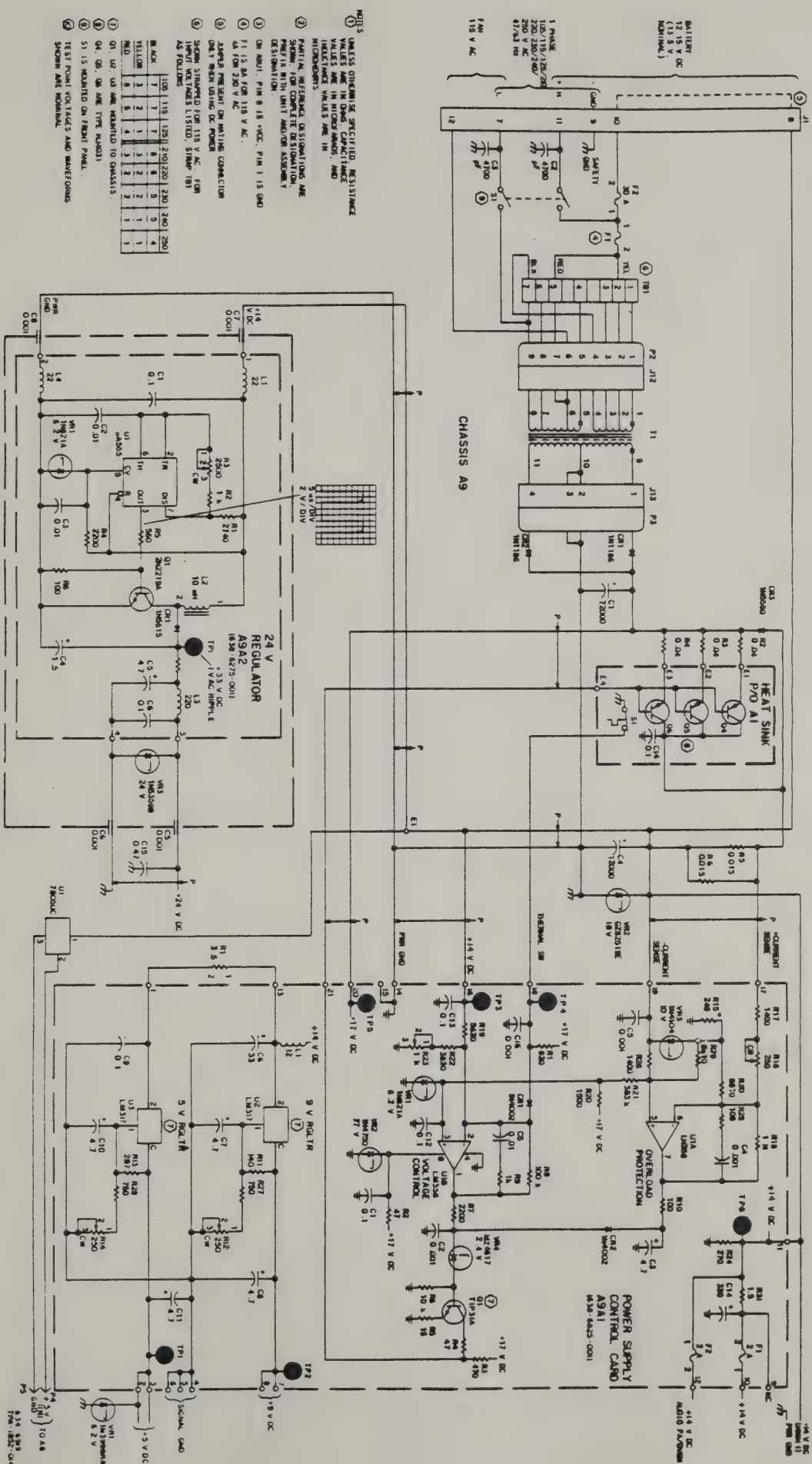


654 6545
7MA-1400-044

FREQUENCY SYNTHESIZER OUTPUT LOOP ASAI 1638 6996 000-0021



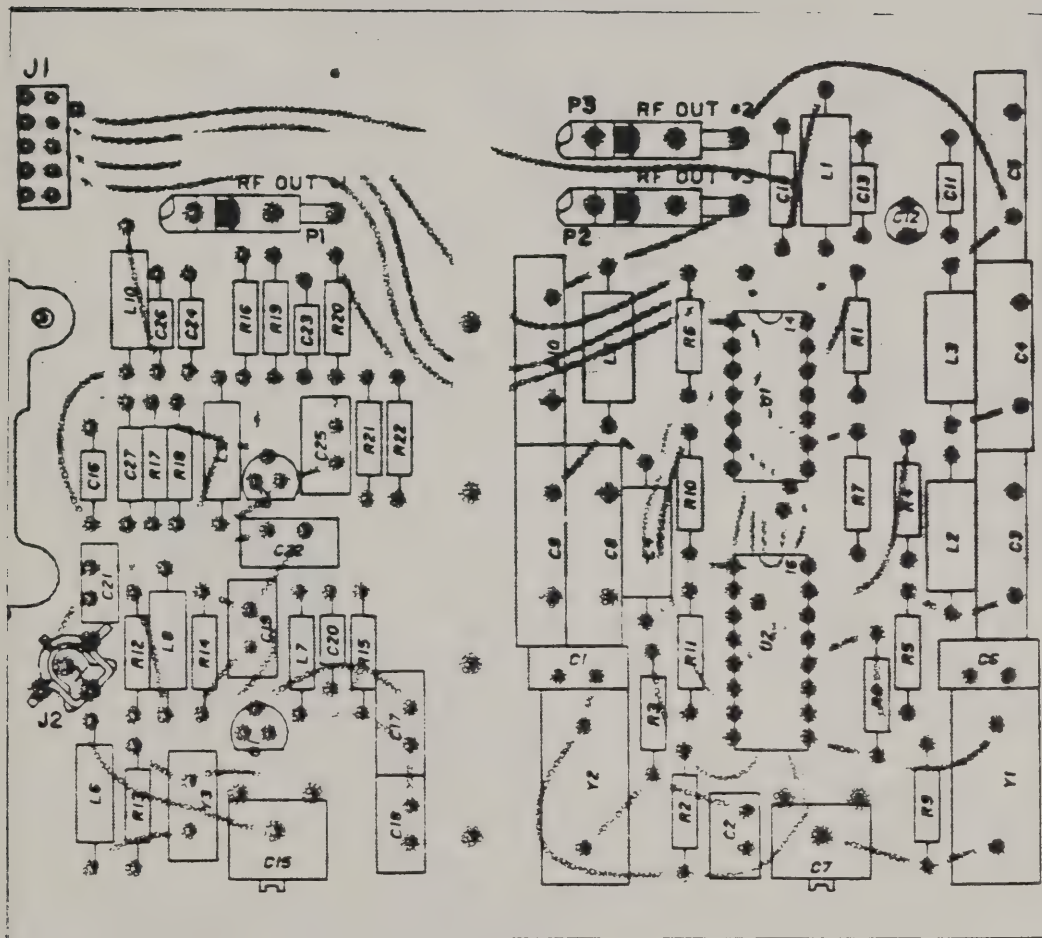
Synthesizer AS, Schematic Diagram
Figure 8 (Sheet 8)



Power Supply Schematic Diagram
Figure 7



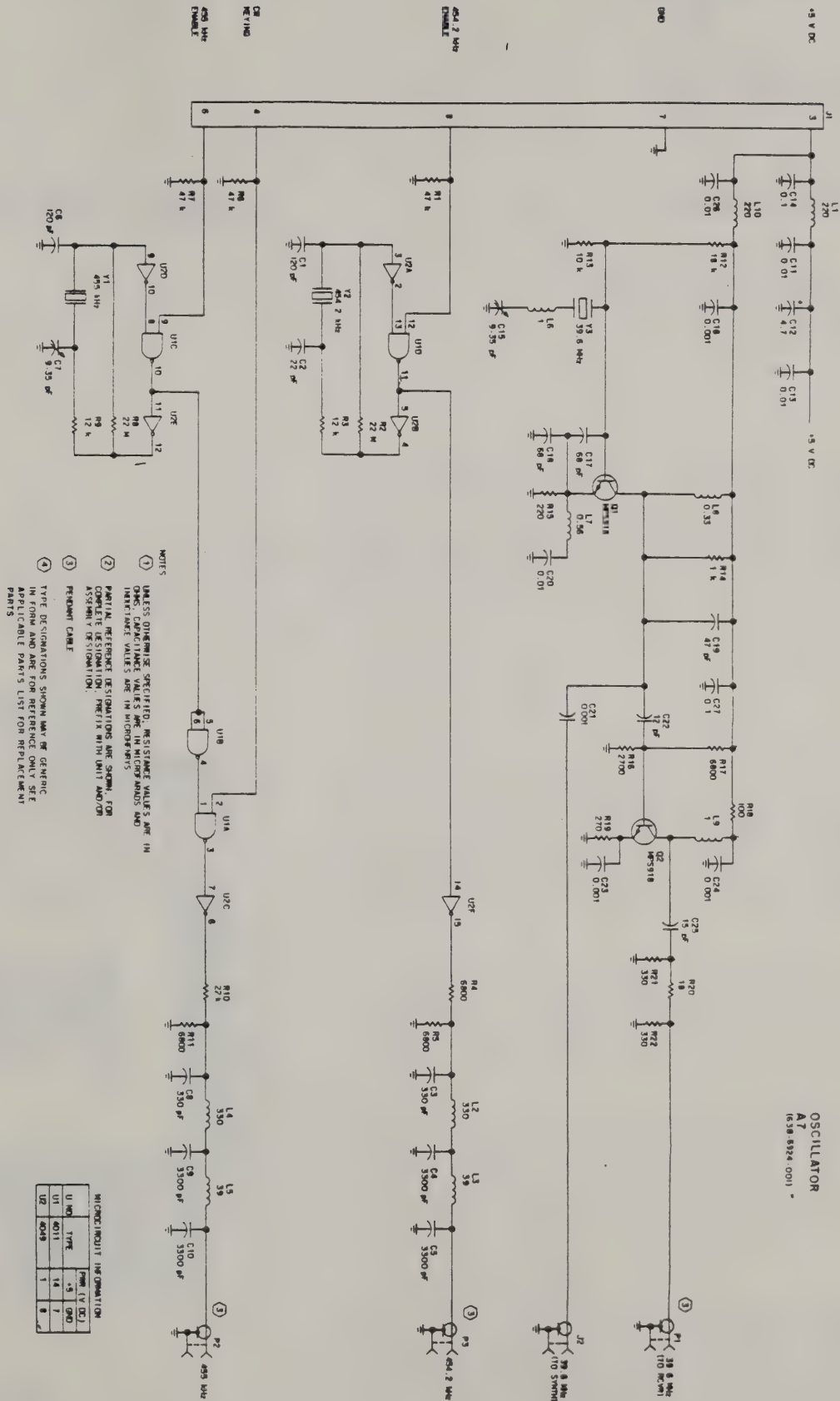
Figure 7



OSCILLATOR A7

Oscillator A7 Circuit Card, Parts Location and Wiring Diagram
Figure 1

OSCILLATOR A7 (638 8324 001)



Oscillator A7, Schematic Diagram
Figure 2



**Rockwell
International**

instructions

Oscillator (638-6918-001, -002)

Collins Telecommunications Products Division

523-0772531-001211

15 October 1982

Printed in USA

1. DESCRIPTION

Oscillator (638-6918-001, -002), shown in figure 1, has an oven oscillator circuit and a standard crystal oscillator circuit. The controlled-temperature oven oscillator is stable, after warm-up, to ± 20 Hz over the

entire temperature range. The oven oscillator circuit develops 39.6- and 4.55-MHz output signals. The standard crystal oscillator circuit develops 454.2-kHz output signal. Oscillator 638-6918-001 is different from 638-6918-002 only in that the -002 has type SMB connectors on the coaxial cables.

2. THEORY (Refer to the schematic diagram, figure 3)

2.1 Oven Oscillator

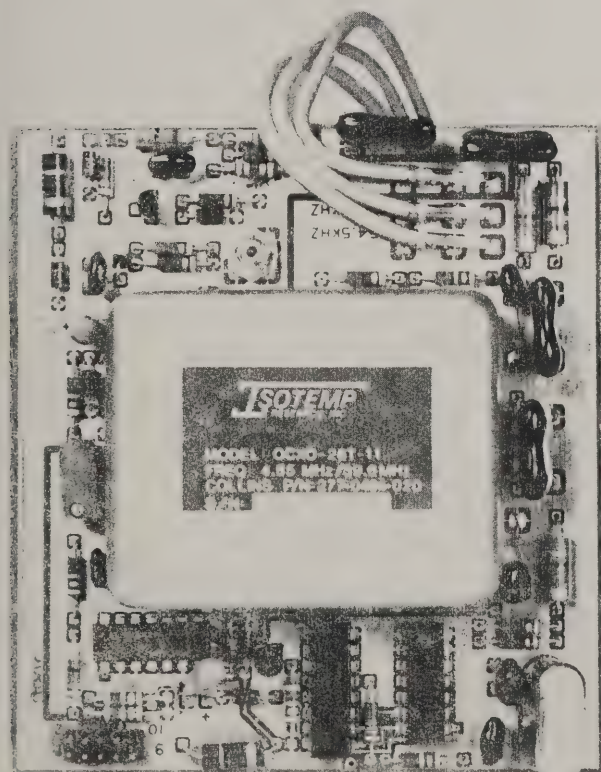
Plus 14.0-V oven voltage for the oscillator is continuously present when power is applied to the unit. The oven temperature is internally controlled and has been factory set. There is no further need for adjustment. The oscillator takes approximately 20 minutes to warm up to achieve the specified frequency stability.

The 39.6-MHz oscillator output is adjustable over a limited range by voltage from R10. This voltage, developed from the regulated +9-V supply, sets the frequency of the oscillator in the oven.

A second oscillator in the oven develops a 4.55-MHz output. There is no frequency adjustment for this oscillator. Slight frequency inaccuracies that might be present will be reduced to a negligible amount when going through U3, a divide-by-10 circuit.

2.1.1 39.6-MHz Output

The 39.6-MHz oscillator output is applied to amplifier Q1, and also directly output through J2. The output from the amplifier goes through 3-dB isolating attenuator R17/R18/R19 before being output at P1.



TPA-5550-017

Oscillator
Figure 1

2.1.2 455-kHz Output

The 4.55-MHz oscillator output is applied to amplifier Q2. A 455-kHz enable input signal enables or inhibits this amplifier. The input enable signal is logic 1 when the 455-kHz output is desired. With a logic 1 input, inverter U2E applies the resulting logic 0 to the emitter of Q2. This causes Q2 to conduct the 4.55-MHz signal to the divide-by-10 counter, U3.

The output of U3 is gated by U1A. The CW keying input enables or inhibits this NAND gate. With the CW mode selected (and the CW key depressed in receiver-exciter units), U1A outputs the 455-kHz signal. The output is inverted by U2F and applied, through filter L4-L5/C6-C8, to the 455-kHz bfo output, P3. This LC filter attenuates harmonics of the 455-kHz square-wave signal output from the logic circuits.

2.2 454.2-kHz Oscillator

The 454.2-kHz oscillator is a crystal oscillator made up of U2A/B, U1D, and Y1. The 454.2-kHz enable signal enables or inhibits the oscillator. A logic 1 enables the NAND gate, U1D. Positive feedback from U2B through Y1 to U2A causes the circuit to oscillate. The resulting output from U1D is a 454.2-kHz square wave. This is inverted by U2C and applied through filter L2-L3/C3-C5, to the 454.2-kHz bfo output, A7P2. The LC filter attenuates harmonics of the 454.2-kHz square-wave signal output from the logic circuits.

3. TESTING

A performance test for the oscillator is given in table 2. In addition to the required performance criteria, troubleshooting comments are given.

It is assumed that the repair technician is trained in solid-state circuit troubleshooting and repair techniques, and is familiar with the test equipment to be used. Step-by-step operating procedures may not be given in all tests and not all possible troubleshooting information can be listed.

Circuit board parts location and wiring diagram, figure 2, and a schematic diagram, figure 3, follow the test procedures.

3.1 Test Equipment Required

Table 1 lists the equipment required to perform the tests. A suggested type is given; however, that specific equipment is not required. Any that meets or exceeds the indicated minimum specifications is acceptable for use.

3.2 Performance Test

The following test procedures measure the performance of the oscillator. After being repaired, repeat the numbered test where repair was performed to verify that no further malfunctions exist.

Table 1. Test Equipment Required.

ITEM	USED FOR	SUGGESTED TYPE	MINIMUM SPECIFICATIONS
RF voltmeter (with 50-ohm adapter)	Measuring oscillator output levels	Boonton 92C with 50-ohm probe	0 to 1-V rms
Frequency counter	Measuring oscillator frequency	Fluke 1910A	0 to 39.600 00 MHz, 1-Hz accuracy

3.2.1 Preliminary Setup

Do not apply power to the equipment until instructed to do so in the procedures. Do not connect power with power switches turned on.

Connect the equipment as instructed in the procedures for each test.

3.2.2 Test Procedures

Perform the tests as given in table 2.

Table 2. Oscillator Test Procedures.

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
1. Test setup	a. If using a receiver-exciter, do not key transmitter during this test. b. Set MODE to CW. c. Disconnect J2. d. Temporarily connect 1000-ohm resistor between center conductor of J2 and ground.		
2. Output levels	a. Turn on primary power to unit and, using high-impedance probe on rf voltmeter, measure 39.6-MHz output level at J2. b. Using high-impedance probe on rf voltmeter, measure 39.6-MHz output level of P1. (Leave oscillator connected to unit.) c. Depress SPOT switch (on unit front panel) and measure 455-kHz output level at P2. d. Measure 454.2-kHz output level at P3.	400 mV rms, or greater 300 mV rms, or greater 10 mV rms, or greater 30 mV rms or greater	Check U4 and associated components. Check Q1 and associated components. Check U4, U2E, Q2, U3, U1A, U2F and associated components. Check U1D, U2A/B, Y1, and associated components.
	Note Oscillator should be on continuously for at least 20 minutes before measuring frequency to accuracy specified.		
3. Frequency	a. Connect frequency counter to J2 across 1000-ohm resistor. Measure frequency. b. Depress SPOT switch and measure frequency at P2. c. Measure frequency at P3.	39.600 00 MHz ± 20 Hz 455.000 kHz ± 20 Hz 454.2 kHz ± 200 Hz	Adjust R10 for correct frequency. Check U1. Adjust for correct frequency. Check U4, Q2, U12E, U3, U1A, U2F. Check Y1, U1D, U2A/B.
4. Control logic	a. Connect rf voltmeter (with 50-ohm adapter) to P3. Note 454.2-kHz rf output then switch MODE to any except CW. b. Connect rf voltmeter (with 50-ohm adapter) to P2. Set MODE to CW. c. Note 455-kHz rf output, then depress SPOT switch.	Oscillator output is turned off when MODE not in CW. Oscillator output is off until turned on by SPOT switch.	Check U1D. If no malfunction present, check receiver-exciter logic circuits.

Table 2. Oscillator Test Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
5. End	a. Disconnect 1000-ohm resistor from J2. Disconnect test equipment. Reconnect J2 and install oscillator in unit.		

4. REPAIR

Repair of the oscillator card is accomplished using standard maintenance and circuit card repair procedures. Refer to the maintenance section of this instruction book for information.

The oven subassembly is a nonrepairable item. Do not attempt to repair it.

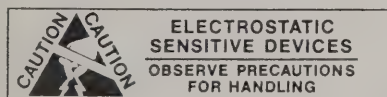
5. PARTS LIST/DIAGRAMS

5.1 Introduction

Caution

This equipment contains electrostatic discharge sensitive (ESDS) devices. Special handling methods and materials must be used to prevent equipment damage. Refer to the maintenance section for the equipment before assembly/disassembly or repair is performed. ESDS items are identified in the description column of the parts list by (ESDS).

All parts list illustrations containing ESDS items are shown with the following symbol:



This paragraph assists in identification and requisition of parts. A parts location illustration, schematic diagram, parts list tabulation, and modification history are included. The parts location illustration is a design engineering drawing that shows exact component placement on the circuit cards.

Use the reference designator indicated on the schematic and parts location diagram to locate parts in the parts list tabulation. The description, Collins part number, usable on code, manufacturer's code and manufacturer's part number are listed for each reference designator.

5.2 Parts List

REF DES Column — Reference designators of each part/subassembly are listed in alphanumeric sequence. These are the reference designators shown on the parts location drawing and schematic diagram.

DESCRIPTION Column — Lists the noun name, modifier, descriptive information, and modification.

Modifications are identified by an alphanumeric identifier assigned to each design change. These identifiers are referenced in the DESCRIPTION column of the parts list in parentheses and on the schematic diagram inside an arrow that points to the change. Each change relates to the revision identifier

(REV) stamped on the circuit card/subassembly and is listed in the EFFECTIVITY column of the modification history. NA (not applicable) in the REVISION IDENT column indicates a documentation change only. The change does not affect the circuit card/subassembly components.

COLLINS PART NUMBER Column — Lists the Collins part number for each item in the parts list.

USABLE ON CODE Column — Part variations within a group of equipment are indicated by a letter code (A, B, C, etc). Absence of a code indicates part applies to all models.

MFR CODE Column — Lists the manufacturer's code from which selected parts can be procured.

MFR PART NUMBER Column — Lists the manufacturer's part number for the selected parts.

Listed below are manufacturer's names and addresses for the manufacturer's codes found in this parts list.

<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>
00136	MCCOY ELECTRONICS CO WATTS AND CHESTNUT ST MT HOLLY SPRINGS PA 17065
00779	AMP INC P O BOX 3608 HARRISBURG PA 17105
00853	SANGAMO WESTON INC SANGAMO CAPACITOR DIV SANGAMO RD P O BOX 128 PICKENS SC 29671
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP 13500 N CENTRAL EXPRESSWAY P O BOX 225012 M/S 49 DALLAS TX 75265
04713	MOTOROLA INC SEMICONDUCTOR GROUP 5005 E MCDOWELL RD PHOENIX AZ 85008
07263	FAIRCHILD CAMERA AND INSTRUMENT CORP SEMICONDUCTOR DIV SUB OF SCHLUMBERGER LTD NORTH AMERICAN SALES MAIL STOP 14-1053 401 ELLIS ST P O DRAWER 7284 MOUNTAIN VIEW CA 94042
12998	QUALITY NAME PLATE INC MILL ROAD EAST GLASTONBURY CT 06025

<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>
13499	ROCKWELL INTERNATIONAL CORP COLLINS TELECOMMUNICATIONS PRODUCTS DIV 855 35TH ST NE P O BOX 728 CEDAR RAPIDS IA 52498
52072	CIRCUIT ASSEMBLY CORP 3169 REDHILL AVE COSTA MESA CA 92626
56289	SPRAGUE ELECTRIC CO 87 MARSHALL ST NORTH ADAMS MA 01247
57582	KAHGAN ELECTRONICS CORP 556 PENINSULA BLVD HEMPSTEAD NY 11550
72136	ELECTRO MOTIVE CORP SUBSIDIARY OF INTERNATIONAL ELECTRONICS CORP P O BOX 7600 LAUTER AVE FLORENCE SC 29501
77250	ALLIED PRODUCTS CORP PHEOLL MFG CO DIV 5700 W ROOSEVELT RD CHICAGO IL 60650
79807	WROUGHT WASHER MFG INC 2100 S BAY ST MILWAUKEE WI 53207
81349	MILITARY SPECIFICATIONS
93790	CORNELL-DUBILIER ELECTRONICS DIV FEDERAL PACIFIC ELECTRIC CO 1605 RODNEY FRENCH BLVD NEW BEDFORD MA 02741
96906	MILITARY STANDARD
98291	SEAELECTRO CORP 225 HOYT MAMARONECK NY 10544

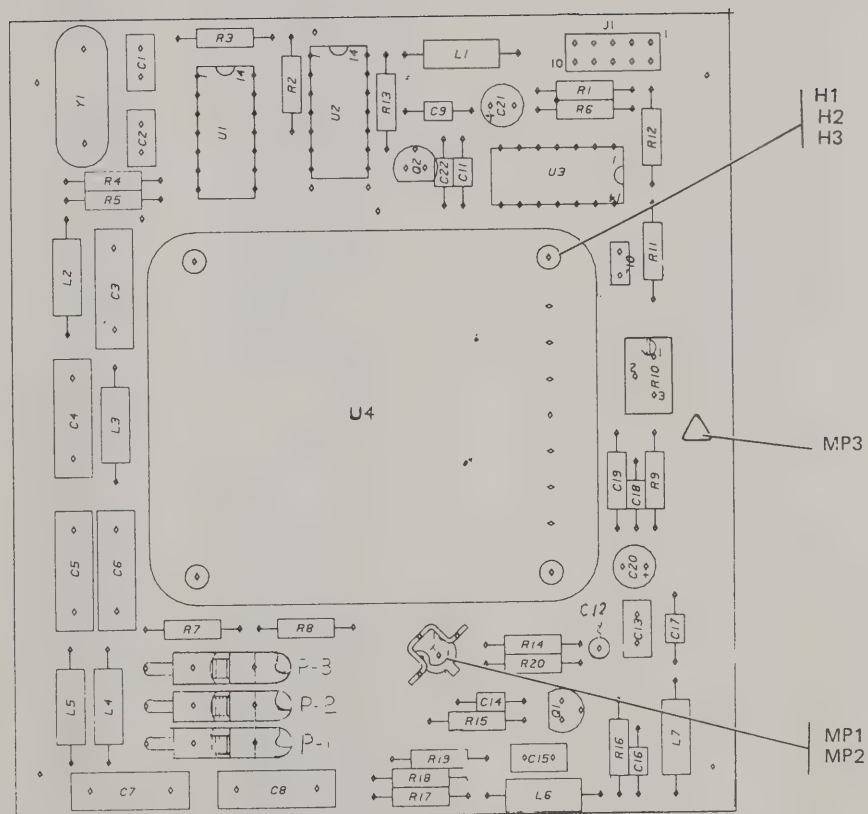
5.3 Usable On Codes

<u>USABLE ON CODES</u>	<u>UNIT PART NUMBER</u>	<u>FIG- ITEM</u>
A	638-6918-001	5
B	638-6918-002	5

5.4 Equipment Covered

Listed below are the circuit cards/subassemblies with the latest effectivity covered by these instructions.

<u>CIRCUIT CARD/ SUBASSEMBLY</u>	<u>COLLINS PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
Oscillator	638-6918-001	REV F
Oscillator	638-6918-002	REV F



OSCILLATOR



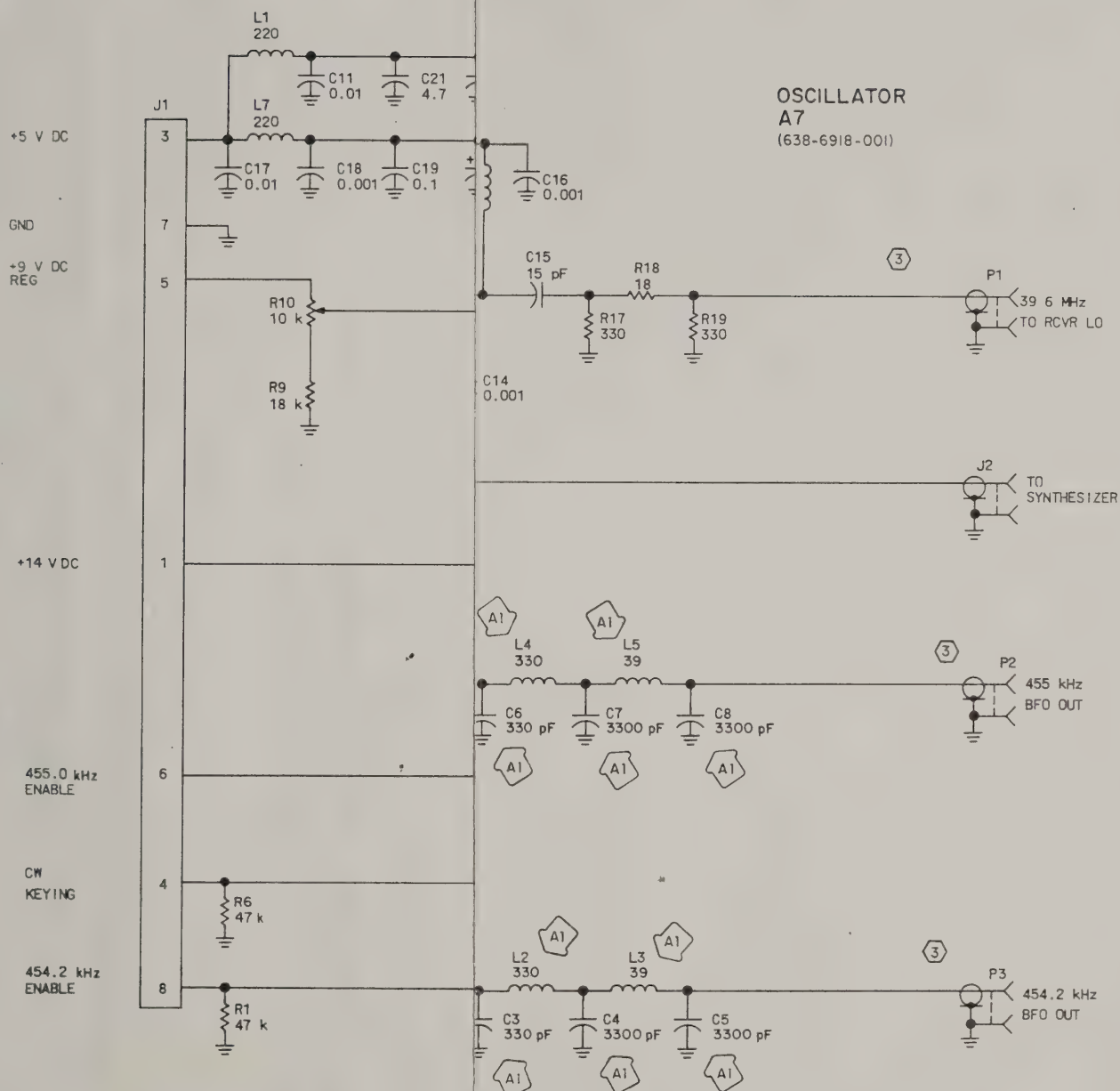
TPA-5534-019

Oscillator, Parts Location Diagram
Figure 2 (Sheet 1 of 2)

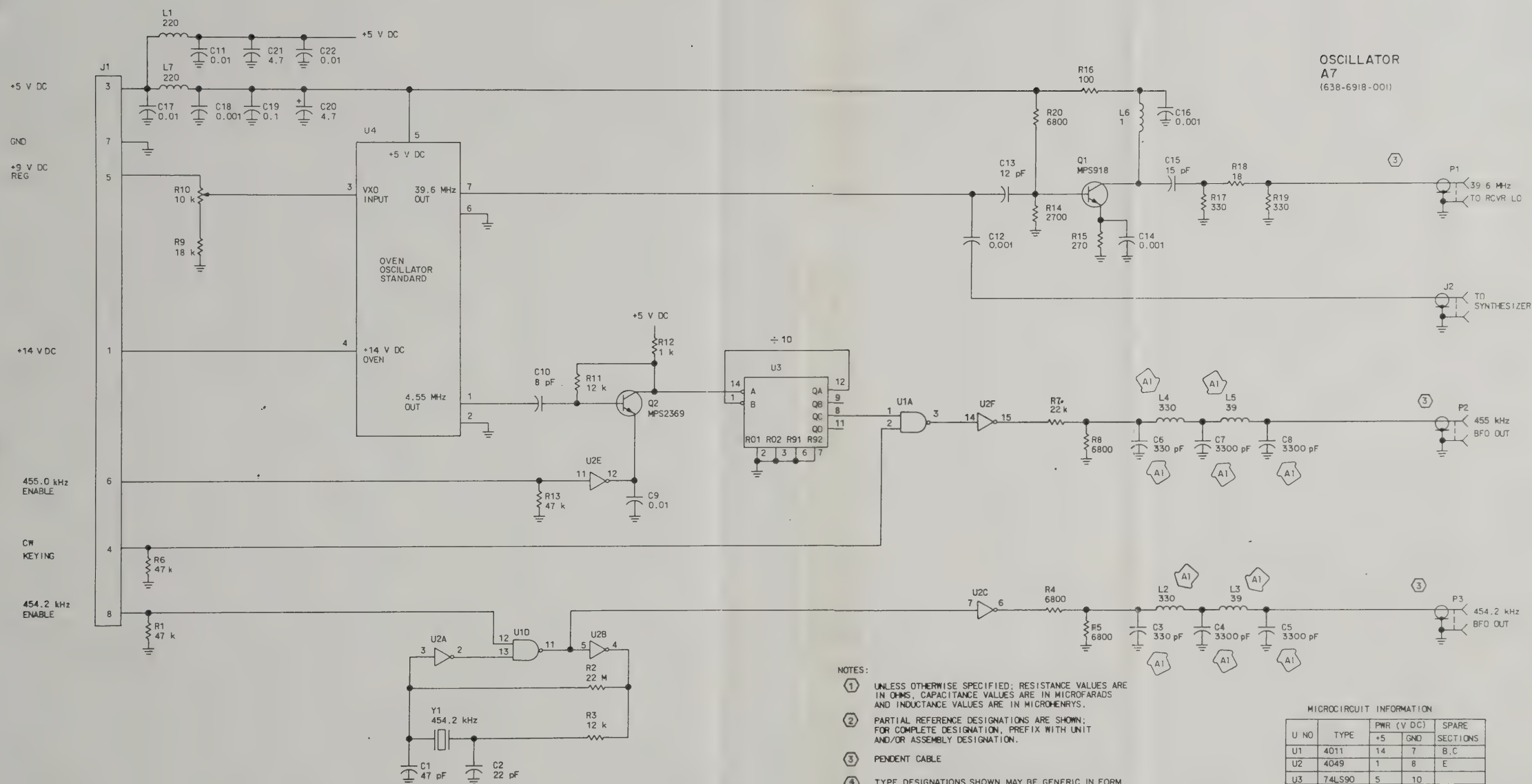
PARTS LIST

MODIFICATION HISTORY

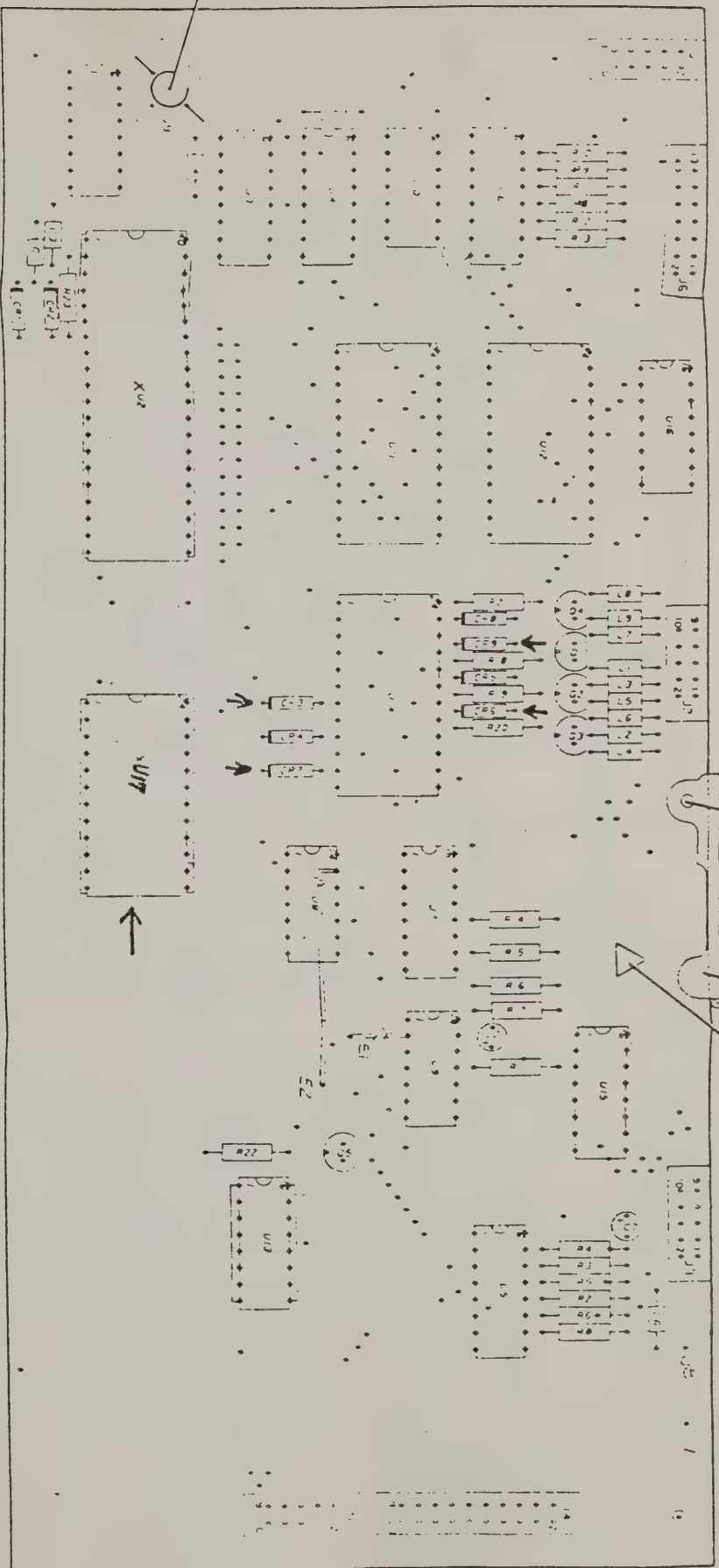
REF DES	DESCRIPTION	COLLINS PART NUMBER	USABLE OM CODE	MFR CODE	MFR PART NUMBER	REVISION IDENT	DESCRIPTION OF REVISION AND REASON FOR CHANGE
	OSCILLATOR	638-6918-001	A		638-6918-002	A1	Changed C3 from 1200 to 330 pF.
	OSCILLATOR	638-6918-002	B				Changed C4 from 1500 to 3300 pF.
C1	CAPACITOR,FXD MICA DIEL, 47PF, 5%, 500V	912-3856-000		81349	CM04ED470J03		Changed C6 from 1200 to 330 pF.
C2	CAPACITOR,FXD MICA DIEL, 22PF, 5%, 500V	912-3842-000		81349	CM04ED220J03		Changed C7 from 1500 to 3300 pF.
C3	CAPACITOR,FXD MICA DIEL, 1200PF, 5%, 500V (A1)	912-3321-000		00853	D205F122J0		Changed L2 from 220 to 330 μ H.
C3	CAPACITOR,FIXED MICA DIEL, 330PF, 5%, 50V	912-4141-490		93790	C05FY331J0		Changed L3 from 220 to 39 μ H.
C4	CAPACITOR,FXD MICA DIEL, 1500PF, 5%, 500V (A1)	912-3327-000		00853	D205F152J0		Changed L4 from 220 to 330 μ H.
C4,C5	CAPACITOR,FXD MICA DIEL, 3300PF, 5%, 500V	912-3354-000		57582	KD20332J501		Changed L5 from 220 to 39 μ H.
C5,C6	CAPACITOR,FXD MICA DIEL, 1200PF, 5%, 500V (A1)	912-3321-000		00853	D205F122J0		
C6	CAPACITOR,FIXED MICA DIEL, 330PF, 5%, 50V	912-4141-490		93790	C05FY331J0		
C7	CAPACITOR,FXD MICA DIEL, 1500PF, 5%, 500V (A1)	912-3327-000		00853	D205F152J0		
C7,C8	CAPACITOR,FXD MICA DIEL, 3300PF, 5%, 500V	912-3354-000		57582	KD20332J501	NA	Data change only.
C8	CAPACITOR,FXD MICA DIEL, 1200PF, 5%, 500V (A1)	912-3321-000		00853	D205F122J0		
C9	CAPACITOR,FXD CER DIEL, 0.01UF,M20%P80%,50V	913-3331-020		56289	292CY5U103D8050		
C10	CAPACITOR,FXD MICA DIEL, 8PF, PORM 0.5PF, 300V	912-4141-110		72136	DM5C0800300WV	NA	Data change only.
C11	CAPACITOR,FXD CER DIEL, 0.001UF,M20%P80%,50V	913-3331-010		56289	292CY5U102D8050		
C12	CAPACITOR,FXD CER DIEL, 0.001UF,M20%P80%,50V	913-3331-010		56289	292CY5U102D8050	NA	Data change only.
C13	CAPACITOR,FXD MICA DIEL, 12PF, 5%, 500V	912-3838-000		81349	CM04CD120J03		
C14	CAPACITOR,FXD CER DIEL, 0.001UF,M20%P80%,50V	913-3331-010		56289	292CY5U102D8050		
C15	CAPACITOR,FXD MICA DIEL, 15PF, 5%, 500V	912-3839-000		81349	CM04CD150J03		
C16	CAPACITOR,FXD CER DIEL, 0.001UF,M20%P80%,50V	913-3331-010		56289	292CY5U102D8050		
C17	CAPACITOR,FXD CER DIEL, 0.001UF,M20%P80%,50V	913-3331-020		56289	292CY5U103D8050		
C18	CAPACITOR,FXD CER DIEL, 0.001UF,M20%P80%,50V	913-3331-010		56289	292CY5U102D8050		
C19	CAPACITOR,FXD CER DIEL, 0.10UF,M20%P80%,50V	913-3331-030		56289	292CY5U104D8050		
C20,C21	CAPACITOR,FXD ELCTLT, 4.7UF, 20%, 35V	184-9102-390		56289	1990475X00350B1		
C22	CAPACITOR,FXD CER DIEL, 0.001UF,M20%P80%,50V (A1)	913-3331-010		56289	292CY5U102D8050		
C22	CAPACITOR,FIXED CER DIEL, 0.01UF, P80%M20%, 50VDC	913-3331-020		56289	292CY5U103Z050B		
H1	NUT,PLAIN,HEX SST, 4-40 (QTY 4)	313-0132-000		77250	P313-0132-000		
H2	WASHER,LOCK SST, 0.115 ID X 0.209 OD (QTY 4)	310-0279-000		96906	MS35338-135		
H3	WASHER,FLAT SST, 0.125 ID X 0.281 OD (QTY 4)	310-6340-000		79807	310-6340-000		
J1	CONNECTOR,HDR	372-2656-100	A	52072	CAD10SP100-230-430		
J1	CONNECTOR,RCPT ELEC	357-7405-010	B	81349	MIL-C-39012/95-001		
L1-L5	COIL,RF 220UH (A1)	240-2715-410		96906	MS75089-15		
L1	COIL,RF 220UH	240-2715-410		96906	MS75089-15		
L2	COIL,RF 330UH	240-2715-430		96906	MS75089-17		
L3	COIL,RF 39UH	240-2715-320		96906	MS75089-6		
L4	COIL,RF 330UH	240-2715-430		96906	MS75089-17		
L5	COIL,RF 39UH	240-2715-320		96906	MS75089-6		
L6	COIL,RF 1UH	240-1568-000		96906	MS18130-8		
L7	COIL,RF 220UH	240-2715-410		96906	MS75089-15		
MP1	CONNECTOR,RCPT ELEC	357-0067-020		00779	226287-2		
MP2	JACK,TIP	360-0079-190		00779	2-332095-4		
MP3	LABEL,PRESS SENS (ESDS)	280-2745-040		12998	280-2745-040		
P1	COAX ASSEMBLY	641-7100-025	A				
P1	CONNECTOR,PLUG ELEC	357-7375-010	B	98291	51-328-3188		
P2	COAX ASSEMBLY	641-7100-026	A		641-7100-026		
P2	CONNECTOR,PLUG ELEC	357-7375-010	B	98291	51-328-3188		
P3	COAX ASSEMBLY	641-7100-027	A		641-7100-027		
P3	CONNECTOR,PLUG ELEC	357-7375-010	B	98291	51-328-3188		
Q1	TRANSISTOR	352-0723-010		04713	MPS918		
Q2	TRANSISTOR	352-5015-010		04713	MPS2369		
R1	RESISTOR,FXD CMPSN, 47K, 10%, 1/4W	745-0809-000		81349	RCR076473KS		
R2	RESISTOR,FXD CMPSN, 22MEGO, 10%, 1/4W	745-0905-000		81349	RCR076226KS		
R3	RESISTOR,FXD CMPSN, 12K, 10%, 1/4W	745-0788-000		81349	RCR076123KS		
R4,R5	RESISTOR,FXD CMPSN, 6.8K, 10%, 1/4W	745-0779-000		81349	RCR076682KS		
R6	RESISTOR,FXD CMPSN, 47K, 10%, 1/4W	745-0809-000		81349	RCR076473KS		
R7	RESISTOR,FXD CMPSN, 22K, 10%, 1/4W	745-0797-000		81349	RCR076223KS		
R8	RESISTOR,FXD CMPSN, 6.8K, 10%, 1/4W	745-0779-000		81349	RCR076682KS		
R9	RESISTOR,FXD CMPSN, 10K, 10%, 1/4W	745-0785-000		81349	RCR076103KS		
R10	RESISTOR,VAR MM, 5K, PORM5%, 3/4W	381-1721-300		81349	RT22C2W503		
R11	RESISTOR,FXD CMPSN, 12K, 10%, 1/4W	745-0788-000		81349	RCR076123KS		
R12	RESISTOR,FXD CMPSN, 1K, 10%, 1/4W	745-0749-000		81349	RCR076102KS		
R13	RESISTOR,FXD CMPSN, 47K, 10%, 1/4W	745-0809-000		81349	RCR076473KS		
R14	RESISTOR,FXD CMPSN, 2.7K, 10%, 1/4W	745-0764-000		81349	RCR076272KS		
R15	RESISTOR,FXD CMPSN, 270 OHMS, 10%, 1/4W	745-0728-000		81349	RCR076271KS		
R16	RESISTOR,FXD CMPSN, 100 OHMS, 10%, 1/4W	745-0713-000		81349	RCR076101KS		
R17	RESISTOR,FIXED CMPSN, 330 OHMS, 10%, 1/4W	745-0731-000		81349	RCR076331KS		
R18	RESISTOR,FXD CMPSN, 18 OHMS, 10%, 1/4W	745-0686-000		81349	RCR076160KS		
R19	RESISTOR,FIXED CMPSN, 330 OHMS, 10%, 1/4W	745-0731-000		81349	RCR076331KS		
R20	RESISTOR,FXD CMPSN, 6.8K, 10%, 1/4W	745-0779-000		81349	RCR076682KS		
U1	INTEGRATED CIRCUIT	351-8159-340		07263	4011BPC		
U2	INTEGRATED CIRCUIT	351-8159-210		07263	F4049BPC		
U3	MIXER	351-1636-010		01295	SN74LS90N		
U4	MIXER,RF	277-0494-020					
Y1	XTAL UNIT,QTZ 454.2KHZ	289-7337-010		00136	289-7337-010		



Oscillator, Schematic Diagram
Figure 3

Oscillator, Schematic Diagram
Figure 3

HF Control Card Conversion



To Convert KWM-380 Control Card to HF-380 Capability remove diodes CR3,6,7,9 and install HF ROM at U17. (Part # 351-8870-000)

Filter board A2A3 must be installed when diodes are removed!

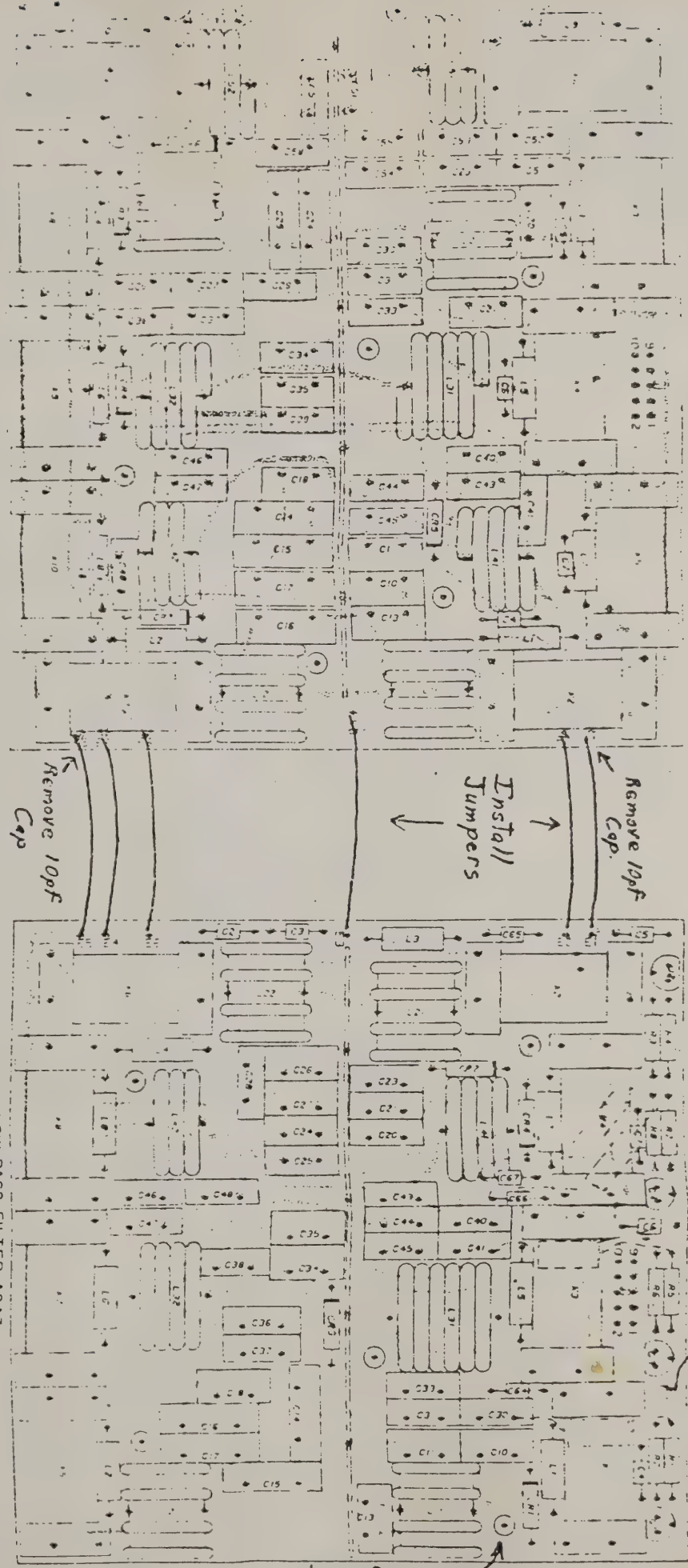
Control, Parts Location
Figure 6 (Sheet 1 of 2)

Add Low Pass Filter card A2A3 to KWM-380 for HF XMTR Capability

Tapion Terminal on backside of Plate.
Route wire from E7 thru hole.

Ground Lug

2.2mhy



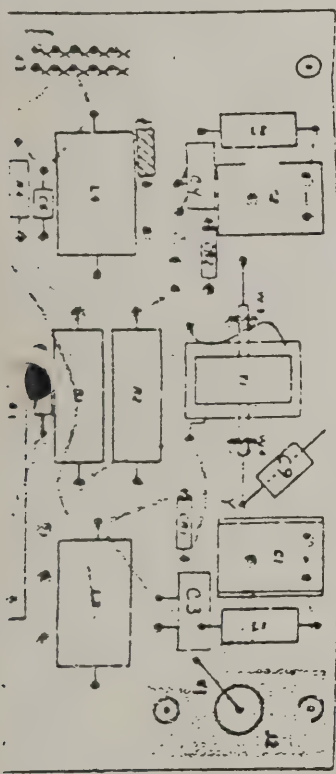
LOW PASS FILTER A2A1

LOW PASS FILTER A2A3

#638-6904-001

"Mounting Hardware for Board"
1 - Screw 343-0137-000 $\frac{1}{2}$ "
4 - Screws 343-0134-000 $\frac{1}{16}$ "
5 - Flat Washers 310-0779-030

"Mounting Hardware for Ground"
1 - Lug 304-3110-010
1 - Nut 313-0132-000
1 - Flat Washer 310-0779-030
1 - Flat Washer 310-0279-000



2.2mhy choke

#240-2715-530

Bus Wire 421-2220-000
Insulated Wire 439-000-000

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INSTALLATION OF A3 BOARD AND CONTROL BOARD MOD ON KWM(HF)-380

1. Unplug unit
2. Remove chassis and top cover to circuit card chamber.
3. Locate low pass filter area in rear compartment.
4. Slowly pull up on handle of metal filter mounting plate, sliding entire plate up from chassis.
5. Make a note of cable connections on A2 Directional Coupler board and remove cables.
6. Set entire assembly on bench with existing A1 board situated to the left.
7. Remove A1 board from plate.
8. Remove 10 pF capacitors as indicated in drawing. Clean holes with solder wick.
9. Reinstall A1 board.
10. CAUTION: BE CAREFUL NOT TO MOVE COILS ON THIS BOARD DURING INSTALLATION. YOU MAY DETUNE YOUR LOW PASS FILTER. Remove wrap from new A3 board. Remove stand offs and discard.
11. Notice 2.2 mH choke with solder lug. Insert the choke through the 1/2" hole in metal plate. This lug will attach to ground in next step. Disregard the teflon standoff on back of plate.
12. Position new A3 board over mounting stand offs to the right of A1. Slowly insert the six jumpers into adjacent holes on the A1 board.
13. Insert longest screw into hole marked on drawing. Do not tighten.
14. Insert remaining four screws into other mounting holes. Now tighten all screws.
15. Slip lug from choke over long bolt and tighten nut.
16. This completes installation of A3 filter board. Reattach cables and slide assembly into compartment. Install loose 10 pin header cable to 10 pin jack on A3 board. Notice the polarity.
17. To modify your control card, pull card from cage.
18. Cut or remove diodes at four positions as marked on drawing.
19. Remove U17 and replace with the proper 351-8870-060 ROM. If you do not have a socket in this position, a socket should be installed.
20. This completes installation of the general coverage transmit modification to your KWM-380. You can button her back up.

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instructions

Collins Telecommunications Products Division

523-0772530-001211

1 August 1982

Low-Pass Filter (641-7132-001)

Printed in USA

1. DESCRIPTION

Low-Pass Filter (641-7132-001), figure 1, consists of low-pass filter A1, 638-6900-001, directional coupler A2, 638-6788-001, and low-pass filter A3, 638-6904-001. The directional coupler has an antenna transfer relay and forward and reflected power detectors. The filter circuit cards have relay-selected filters covering frequencies from 1.6 to 29.9999 MHz.

2. PRINCIPLES OF OPERATION (Refer to schematic diagram, figure 3)

2.1 Low Pass Filters A1 and A3

The filters on the A1 and A3 assemblies are dual pi-section low-pass types. The high-frequency rolloff begins at the upper frequency of the band covered by the respective filter. The rf path through an individual filter is switched by a relay at each end of the filter. On A1, logic 0 band enable signal, developed by the control card, energizes the two relays associated with the band containing the frequency. On A3, a logic 1 band enable signal from the control card switches on a transistor to energize the two relays associated with the band containing the frequency. The energized relays switch in the filter covering the operating frequency.

2.2 Directional Coupler A2

The directional coupler develops analog voltages of the forward and reverse rf power to the antenna. These signals are used in the power amplifier control circuits to generate ALC. Relay K1 switches the rf path between the power amplifier output and the receiver input connectors. The relay is energized by the +9 V XMT signal during transmit.

Rf current through T1 produces voltages across R1 and R2 that are proportional to the rf line current. Voltages are produced across the C1/L1/C3 and C2/L2/C4 series networks that are proportional to the rf line current. The voltage at R2 is added to that developed across C4. The combined voltage is rectified and filtered by CR2, L4, and C6, then applied to the power amplifier as the forward power analog voltage. The reflected power analog voltage applied to the power amplifier is developed similarly by R1, CR1, C3, L3, and C5. Capacitors C1 and C2 are adjusted to balance the voltages due to the sampled rf line voltage with those due to the sampled rf line current.

3. TESTING/TROUBLESHOOTING PROCEDURES

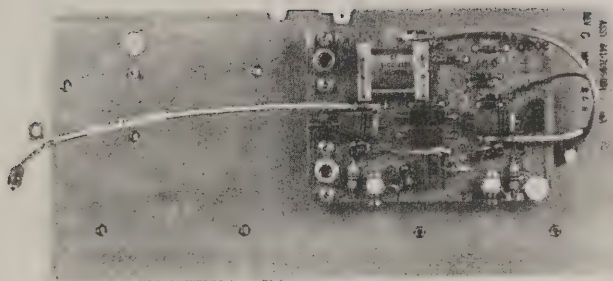
Performance tests for the low-pass filter are given in tables 2 and 3. In addition to the required performance criteria, troubleshooting comments are given.

It is assumed that the repair technician is trained in solid-state circuit troubleshooting and repair techniques, and is familiar with the test equipment to be used. Step-by-step operating procedures may not be given in all tests and not all possible troubleshooting information can be listed.

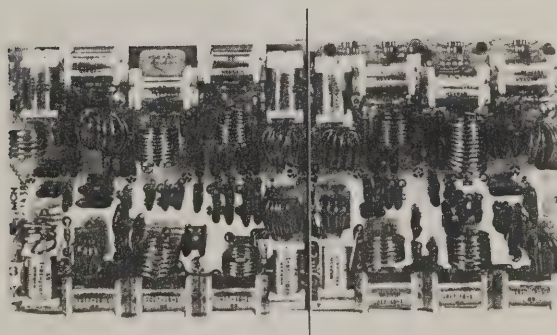
Testing and troubleshooting of the low-pass filter requires the low-pass filter be installed in the transceiver.

3.1 Test Equipment Required

Table 1 lists the equipment required to perform the tests. A suggested type is given; however, if that specific equipment is not available, any that meets or



A2



A1

A3

TPA-5794-017

Low-Pass Filter Assembly
Figure 1

exceeds the indicated minimum specifications is acceptable for use.

3.2 Performance Test

The following test procedures measure the performance of the low-pass filter. After being repaired, repeat the numbered test where repair was performed to verify that no further malfunctions exist.

3.2.1 Preliminary Setup

Be certain no power is applied to the equipment until instructed to do so in the procedures. Do not connect power with power switches turned on.

Connect the equipment as instructed in the procedures for each test.

3.2.2 Test Procedures

Perform the tests as given in tables 2 and 3.

Table 1. Test Equipment Required.

ITEM	USED FOR	SUGGESTED TYPE	MINIMUM SPECIFICATIONS
Rf load	Terminating filter output	Bird 8135	150-W rf, 50-ohm, 2 to 30 MHz
Vector impedance meter	Measuring phase angle and impedance of filters	Hewlett-Packard 4815A	Phase angles to $\pm 10^\circ$, impedance to 70 ohms
Rf signal generator	Applying rf signals to filters	Hewlett-Packard 8640B	3 to 40 MHz, 2-V rf output, 50-ohm
Rf voltmeter	Measuring rf voltage at filters	Boonton 92C	0 to 0.1 V rf
Coax jumper (A2 P2 to A2P3)	Bypassing low-pass filter	P/N 634-8283-011	
Rf load	Terminating directional coupler transmit output	Bird 8329	150-W rf, 50-ohm, 2 to 30 MHz
Power meter	Measuring rf power output	HP 432B	88 watts at 30 MHz
Rf source	Supplying 100-watt rf input	KWM 380	100-watt, 30-MHz
12-volt power supply	Applying +9 V dc to directional coupler	HP 721A	+9 V dc
Digital voltmeter	Detector output measurements	HP 8000A	0 to 5 V dc

Table 2. Low-Pass Filter A1 Testing and Troubleshooting Procedures.

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL																																																				
1. Test setup	a. Disconnect coax from receiver-exciter J1 to power amplifier (to keep rf from power amplifier). b. Connect 50-ohm load (Bird 8135) to A2J2. c. Connect vector impedance meter to A2J1. (Use probe-to-BNC adapter, then BNC-to-phono connector adapter for short as possible connection.) d. Turn on transceiver.																																																						
2. Filter tuning impedance measurement	a. Key transceiver (press in MOX switch) and perform following steps for each filter in A1. (1) Select transceiver frequency falling within band of filter being tested. <table><thead><tr><th><u>FILTER</u></th><th><u>DIAL FREQ</u></th></tr></thead><tbody><tr><td>A2 L11/L12</td><td>1.95</td></tr><tr><td>A3 L11/L12</td><td>2.50</td></tr><tr><td>A2 L21/L22</td><td>3.55</td></tr><tr><td>A3 L21/L22</td><td>4.50</td></tr><tr><td>A3 L31/L32</td><td>6.00</td></tr><tr><td>A2 L31/L32</td><td>7.15</td></tr><tr><td>A3 L41/L42</td><td>12.00</td></tr><tr><td>A2 L41/L42</td><td>14.15</td></tr><tr><td>A2 L51/L52</td><td>29.00</td></tr></tbody></table> (2) Slowly sweep meter frequency across filter band while noting input impedance and maximum phase angle for each filter. <table><thead><tr><th><u>FREQ RANGE (MHz)</u></th><th><u>FILTER</u></th></tr></thead><tbody><tr><td>1.6-2</td><td>A1 L11/L12</td></tr><tr><td>2-3</td><td>A3 L11/L12</td></tr><tr><td>3-4</td><td>L1 L21/L22</td></tr><tr><td>4-5</td><td>A3 L21/L22</td></tr><tr><td>5-7</td><td>A3 L31/L32</td></tr><tr><td>7-10</td><td>A1 L31/L32</td></tr><tr><td>10-14</td><td>A3 L41/L42</td></tr><tr><td>14-20</td><td>A1 L41/L42</td></tr><tr><td>20-30</td><td>A1 L51/L52</td></tr></tbody></table>	<u>FILTER</u>	<u>DIAL FREQ</u>	A2 L11/L12	1.95	A3 L11/L12	2.50	A2 L21/L22	3.55	A3 L21/L22	4.50	A3 L31/L32	6.00	A2 L31/L32	7.15	A3 L41/L42	12.00	A2 L41/L42	14.15	A2 L51/L52	29.00	<u>FREQ RANGE (MHz)</u>	<u>FILTER</u>	1.6-2	A1 L11/L12	2-3	A3 L11/L12	3-4	L1 L21/L22	4-5	A3 L21/L22	5-7	A3 L31/L32	7-10	A1 L31/L32	10-14	A3 L41/L42	14-20	A1 L41/L42	20-30	A1 L51/L52	Maximum phase angle, θ, for any filter is $\pm 10^\circ$. Impedance, Ω, as indicated for max phase deviation. <table><thead><tr><th><u>IF PHASE IS NMT</u></th><th><u>IMPED-ANCE RANGE IS</u></th></tr></thead><tbody><tr><td>$\pm 10^\circ$</td><td>46-55</td></tr><tr><td>$\pm 8^\circ$</td><td>44-57</td></tr><tr><td>$\pm 6^\circ$</td><td>43-58</td></tr><tr><td>$\pm 4^\circ$</td><td>42-59</td></tr><tr><td>$\pm 2^\circ$</td><td>42-60</td></tr></tbody></table>	<u>IF PHASE IS NMT</u>	<u>IMPED-ANCE RANGE IS</u>	$\pm 10^\circ$	46-55	$\pm 8^\circ$	44-57	$\pm 6^\circ$	43-58	$\pm 4^\circ$	42-59	$\pm 2^\circ$	42-60	If not within specified limits, increase output coil spacing to set to maximum allowable positive value at high end of band. Adjust input coil for middle and low end of band. Repeat step (2) to recheck measurement.
<u>FILTER</u>	<u>DIAL FREQ</u>																																																						
A2 L11/L12	1.95																																																						
A3 L11/L12	2.50																																																						
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A2 L51/L52	29.00																																																						
<u>FREQ RANGE (MHz)</u>	<u>FILTER</u>																																																						
1.6-2	A1 L11/L12																																																						
2-3	A3 L11/L12																																																						
3-4	L1 L21/L22																																																						
4-5	A3 L21/L22																																																						
5-7	A3 L31/L32																																																						
7-10	A1 L31/L32																																																						
10-14	A3 L41/L42																																																						
14-20	A1 L41/L42																																																						
20-30	A1 L51/L52																																																						
<u>IF PHASE IS NMT</u>	<u>IMPED-ANCE RANGE IS</u>																																																						
$\pm 10^\circ$	46-55																																																						
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$\pm 6^\circ$	43-58																																																						
$\pm 4^\circ$	42-59																																																						
$\pm 2^\circ$	42-60																																																						
3. Stop band attenuation	b. Unkey transmitter and disconnect vector impedance meter and 50-ohm load.																																																						
(Cont)	a. Connect rf signal generator to A2J1. Adjust generator output for 1.0-V. Maintain this level throughout test. b. Connect rf voltmeter to A2J2 (or transceiver rf connector J4).																																																						

Table 2. Low-Pass Filter A1 Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL																														
3. (Cont)	c. Tune transceiver to frequency falling within band of filter being tested. d. Key transceiver e. Set signal generator output to frequency indicated and measure rf voltage. Repeat for all filters. <table><tr><td>FILTER (MHz)</td><td>DIAL FREQ</td><td>SIG GEN FREQ (MHz)</td></tr><tr><td>1.6-2</td><td>1.9</td><td>3.2</td></tr><tr><td>2-3</td><td>2.5</td><td>4.0</td></tr><tr><td>3-4</td><td>3.5</td><td>6.0</td></tr><tr><td>4-5</td><td>4.5</td><td>8.0</td></tr><tr><td>5-7</td><td>6.0</td><td>10.0</td></tr><tr><td>7-10</td><td>8.0</td><td>14.0</td></tr><tr><td>10-14</td><td>12.0</td><td>20.0</td></tr><tr><td>14-20</td><td>15.0</td><td>28.0</td></tr><tr><td>20-30</td><td>28.0</td><td>40.0</td></tr></table> f. Unkey transceiver. Disconnect signal generator, voltmeter, and load. Reconnect coax between power amplifier P1 and receiver-exciter J1.	FILTER (MHz)	DIAL FREQ	SIG GEN FREQ (MHz)	1.6-2	1.9	3.2	2-3	2.5	4.0	3-4	3.5	6.0	4-5	4.5	8.0	5-7	6.0	10.0	7-10	8.0	14.0	10-14	12.0	20.0	14-20	15.0	28.0	20-30	28.0	40.0	Rf voltage through filter is not more than 0.056-V.	Check for correct component values and possible coil damage.
FILTER (MHz)	DIAL FREQ	SIG GEN FREQ (MHz)																															
1.6-2	1.9	3.2																															
2-3	2.5	4.0																															
3-4	3.5	6.0																															
4-5	4.5	8.0																															
5-7	6.0	10.0																															
7-10	8.0	14.0																															
10-14	12.0	20.0																															
14-20	15.0	28.0																															
20-30	28.0	40.0																															

Table 3. Directional Coupler A2 Testing and Troubleshooting Procedures.

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
1. Null	Note Because of the unlikelihood of a fault in the directional coupler, this circuit need not be tested unless a malfunction is suspected. In normal operation, for 100-watt rf output, forward power detected output is $+2.2 \pm 0.2$-V dc and reflected power detected output is 0.0 V dc. a. Remove assembly A2 from transceiver. b. Temporarily connect coax jumper between P2 and P3 on A2. c. Connect 50-ohm load to (Bird 8135) A2J2. d. Connect 30-MHz, 100-watt output source to A2P1. Turn on source. e. Using digital voltmeter measure dc voltage at: A2J3-2 A2J3-3 f. Turn off rf source. Connect source to A2J2 and load to A2P1. Turn on source. g. Using digital voltmeter, measure dc voltage at: A2J3-2 A2J3-3 h. Turn off rf source.	Not more than $+0.1$-V dc $+2.2 \pm 0.2$-V dc $+2.2 \pm 0.2$-V dc Not more than $+0.1$-V dc	Adjust A2C1 for null, not more than $+0.1$-V dc. Adjust A2C2 for correct voltage. Adjust A2C1 for correct voltage. Adjust A2C2 for null, not more than $+0.1$-V dc
2. Output	a. Connect 50-ohm load (Bird 8329) in parallel with 50-ohm load (Bird 8135) connected to A2J2. Connect power meter to 50-ohm load (Bird 8329). Note Keep coax lengths between each rf load and A2J2 as short as possible. Load impedance at A2J2 as measured by vector impedance meter should be 25 ± 10 ohms at $0 \pm 10^\circ$ phase angle at 30 MHz.		
(Cont)			

Table 3. Directional Coupler A2 Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
2. (Cont)	b. Turn on rf power source. Adjust rf power source for a reading of 44 watts on the power meter. Note Power meter reading equals 1/2 directional coupler output power. c. Using digital voltmeter, measure dc voltage at: A2J3-2 A2J3-3 d. Turn off rf power source and disconnect test equipment.	0.45 to 0.7-V dc 2.3 to 2.7-V dc	Check reflected power detector circuit. Check forward power detector circuit.
3. Tr relay	a. Connect rf voltmeter to receive rf input A2P1. b. Connect signal generator to A2J2. Set signal generator to 1 V rf at 2 MHz. c. Momentarily connect +9-V dc input to A2J3-7 (+9 V XMT). d. Disconnect test equipment.	Voltmeter indicates 1.0 $\pm$ 0.2-V rms Voltmeter indicates 0 V rms	Check A2K1. Check A2K1 and associated circuit.
4. Coax inter lock	a. Enable transmit input (pin 7). b. Check for dc continuity to ground from J2 center conductor.	Forward power analog (pin 3) output is less than 50 mV dc when rf input (J1) is grounded and greater than 2.5 V dc when J1 is open.	

4. REPAIR

Repair of the low-pass filter is accomplished using standard maintenance and circuit card repair procedures.

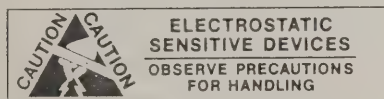
5. PARTS LIST/DIAGRAMS

5.1 Introduction

Caution

This equipment contains electrostatic discharge sensitive (ESDS) devices. Special handling methods and materials must be used to prevent equipment damage. Refer to the maintenance section for the equipment before assembly/disassembly or repair is performed. ESDS items are identified in the description column of the parts list by (ESDS).

All parts list illustrations containing ESDS items are shown with the following symbol:



This paragraph assists in identification and requisition of parts. A parts location illustration, schematic diagram, parts list tabulation, and modification history are included. The parts location illustration is a design engineering drawing that shows exact component placement on the circuit cards.

Use the reference designator indicated on the schematic and parts location diagram to locate parts in the parts list tabulation. The description, Collins part number, usable on code, manufacturer's code and manufacturer's part number are listed for each reference designator.

5.2 Parts List

REF DES Column — Reference designators of each part/subassembly are listed in alphanumeric sequence. These are the reference designators shown on the parts location drawing and schematic diagram.

DESCRIPTION Column — Lists the noun name, modifier, descriptive information, and modification.

Modifications are identified by an alphanumeric identifier assigned to each design change. These identifiers are referenced in the DESCRIPTION column of the parts list in parentheses and on the schematic diagram inside an arrow that points to the change. Each change relates to the revision identifier (REV) stamped on the circuit card/subassembly and is listed in the EFFECTIVITY column of the modification history. NA (not applicable) in the REVISION IDENT column indicates a documentation change only. The change does not affect the circuit card/subassembly components.

COLLINS PART NUMBER Column — Lists the Collins part number for each item in the parts list.

USABLE ON CODE Column — Part variations within a group of equipment are indicated by a letter code (A, B, C, etc). Absence of a code indicates part applies to all models.

MFR CODE Column — Lists the manufacturer's code from which selected parts can be procured.

MFR PART NUMBER Column — Lists the manufacturer's part number for the selected parts.

Listed below are manufacturer's names and addresses for the manufacturer's codes found in this parts list.

MFR CODE	MANUFACTURER'S NAME AND ADDRESS
00779	AMP INC P O BOX 3608 HARRISBURG PA 17105
02113	COILCRAFT INC 1102 SILVER LAKE RD CARY IL 60013
04713	MOTOROLA INC SEMICONDUCTOR GROUP 5005 E MCDOWELL RD PHOENIX AZ 85008
12998	QUALITY NAME PLATE INC MILL ROAD EAST GLASTONBURY CT 06025
13499	ROCKWELL INTERNATIONAL CORP COLLINS TELECOMMUNICATIONS PRODUCTS DIV 855 35TH ST NE P O BOX 728 CEDAR RAPIDS IA 52498
18542	WABASH RELAY AND ELECTRONICS DIV WABASH INC 1ST AND WEBSTER STS P O BOX 708 WABASH IN 46992

MFR CODE	MANUFACTURER'S NAME AND ADDRESS
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20462	PREM ENTERPRISES INC 3519 N CHAPEL HILL MC HENRY IL 60050
25184	PRECISION RUBBER PRODUCTS CORP HARTMAN DRIVE LEBANON TN 37087
28480	HEWLETT-PACKARD CO CORPORATE HQ 3000 HANOVER ST PALO ALTO CA 94304
31433	UNION CARBIDE CORP ELECTRONICS DIV HWY 276 SE P O BOX 5928 GREENVILLE SC 29606
52072	CIRCUIT ASSEMBLY CORP 3169 REDHILL AVE COSTA MESA CA 92626
56289	SPRAGUE ELECTRIC CO 87 MARSHALL ST NORTH ADAMS MA 01247
72136	ELECTRO MOTIVE CORP SUBSIDIARY OF INTERNATIONAL ELECTRONICS CORP P O BOX 7600 LAUTER AVE FLORENCE SC 29501
77250	ALLIED PRODUCTS CORP PHEOLL MFG CO DIV 5700 W ROOSEVELT RD CHICAGO IL 60650
81349	MILITARY SPECIFICATIONS
82389	SWITCHCRAFT INC SUB OF RAYTHEON CO 5555 N ELSTRON AVE CHICAGO IL 60630
96906	MILITARY STANDARD
98291	SEAELECTRO CORP 225 HOYT MAMARONECK NY 10544

5.3 Equipment Covered

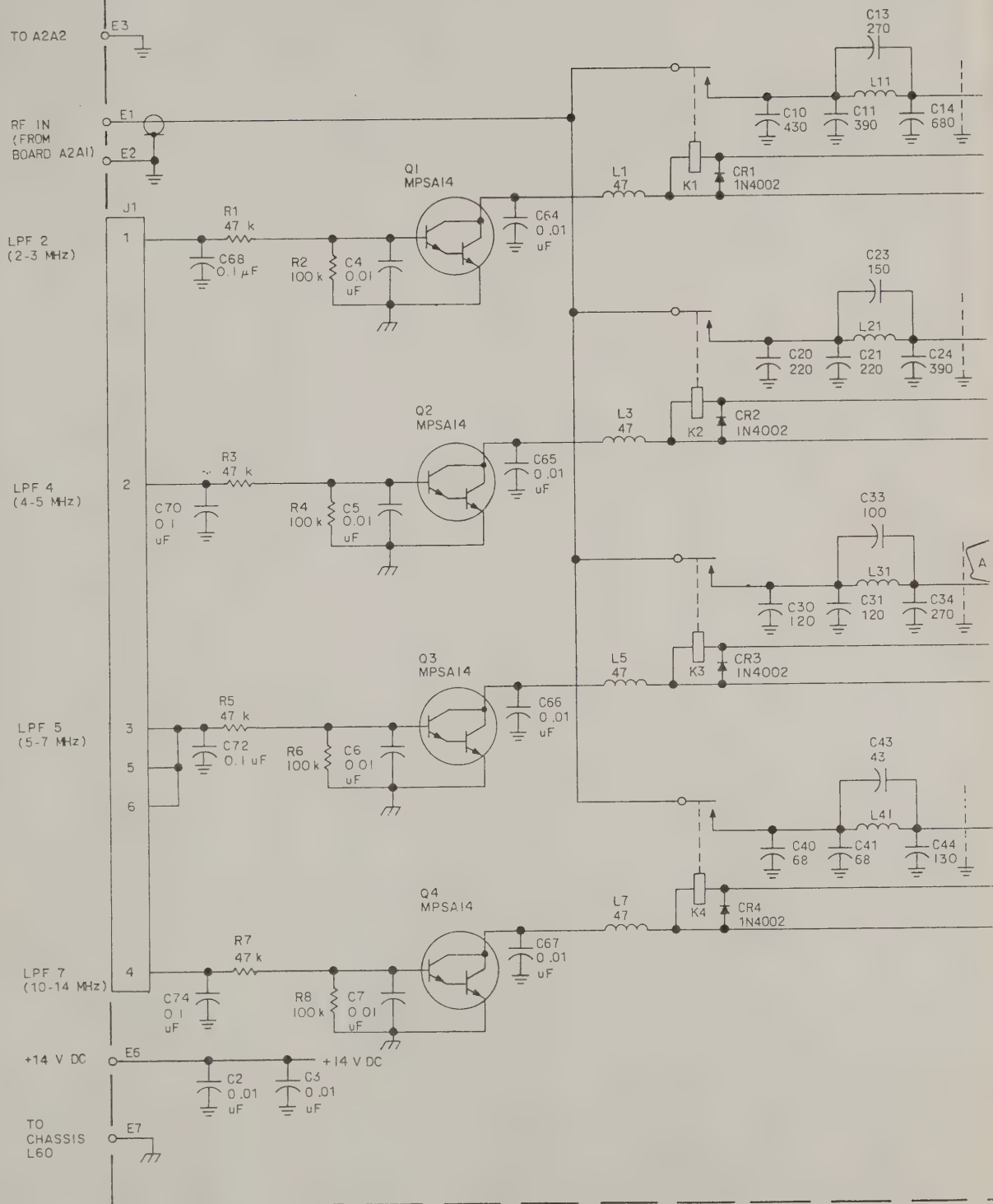
Listed below are the circuit cards/subassemblies with the latest effectivity covered by these instructions.

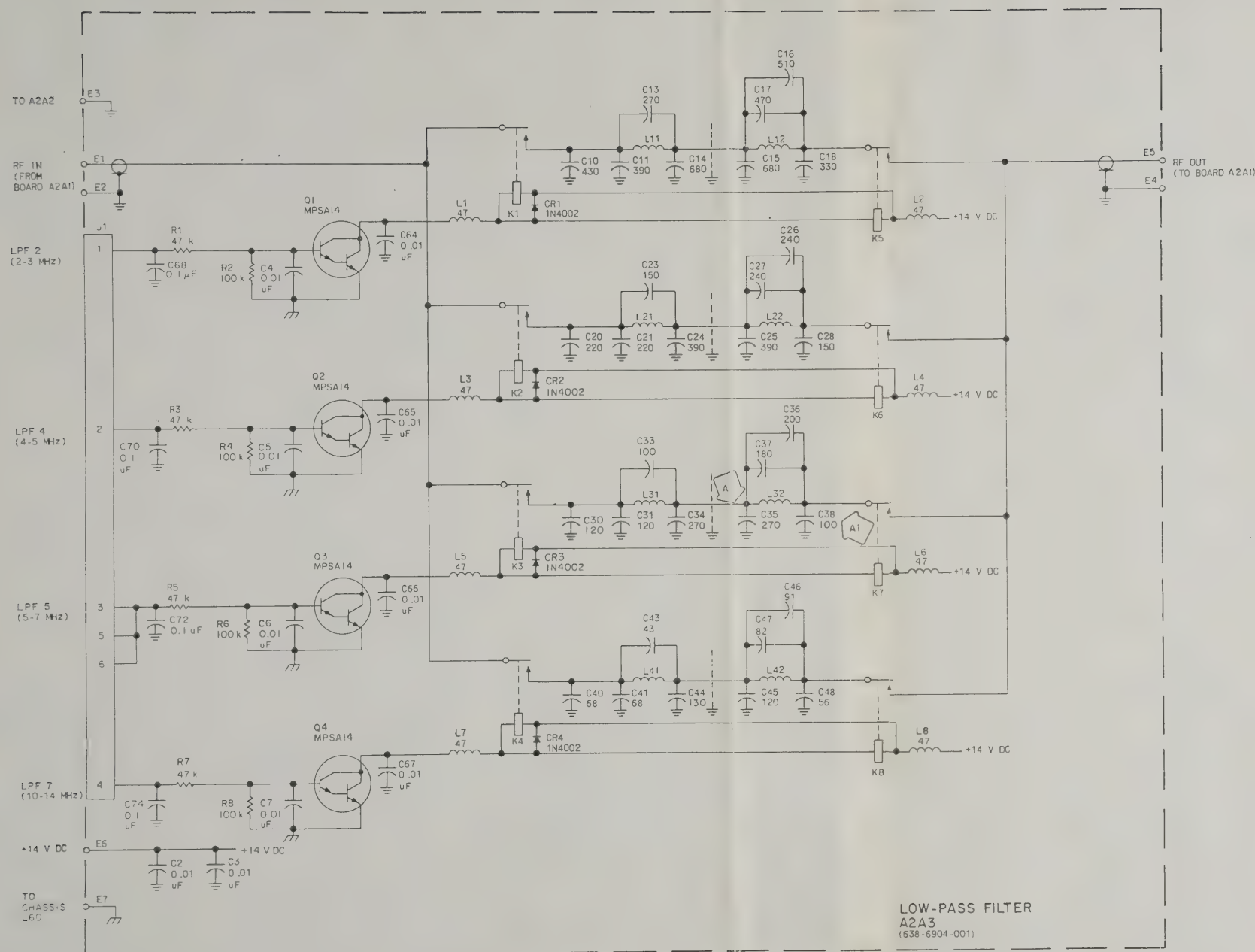
CIRCUIT CARD/ SUBASSEMBLY	COLLINS PART NUMBER	LATEST EFFECTIVITY
Low-Pass Filter	641-7132-001	REV D
Low-Pass Filter Circuit Card	638-6904-001	REV J
Standard Low-Pass Filter Circuit Card	638-6900-001	REV F
Directional Coupler	638-6788-001	REV N

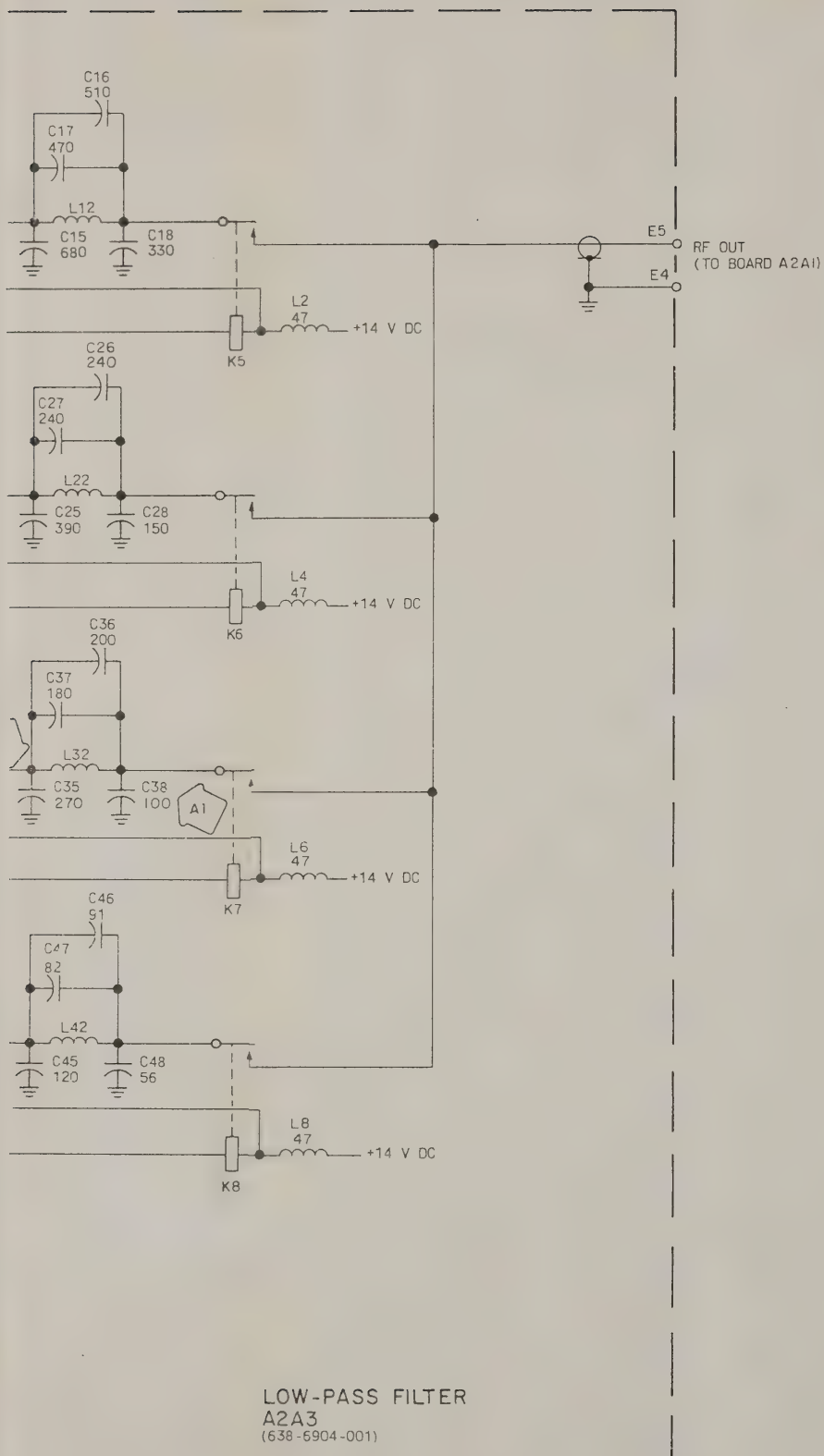
PARTS LIST

PARTS LIST (

DESCRIPTION	COLLINS PART NUMBER	USABLE ON CODE	MFR CODE	MFR PART NUMBER	SMR CODE	REF DES	DESCRIPTION	
H1 LOW PASS FILTER	641-7132-001					R8	RESISTOR,FXD CHPSN, 0.10MEGO, 10%, 1/4W	74
H2 WASHER,LOCK SST, 0.115 ID X 0.209 OD (QTY 1)	310-0279-000		96906	MS35338-135				
H3 NUT,PLAIN,HEX SST, 4-40 (QTY 1)	313-0132-000		77250	P313-0132-000				
H4 SCREW,MACH STL, 4-40 X 1/2 (QTY 1)	343-0137-000		96906	MS1957-17		CR1	STANDARD LOW PASS FILTER CIRCUIT CARD	63
H5 WASHER,FLAT CRES, 0.125ID X 0.250 OD	310-0779-030		96906	MS15795-803		CR2-CR6	SEMICONV DEVICE	35
H6 WASHER,LOCK SST, 0.115 ID X 0.209 OD (QTY 5)	310-0279-000		96906	MS35338-135		C1	NOT USED	
H7 SCREW,MACH SST, 4-40 X 5/16 (QTY 11)	343-0134-000		96906	MS1957-14		C2-C8	CAPACITOR,FXD CER DIEL, 0.01UF,M20%P80%,50V	91
H8 WASHER,FLAT CRES, 0.125ID X 0.250 OD (QTY 7)	310-0779-030		96906	MS15795-803		C9	NOT USED	
H9 SCREW,MACH STL, 4-40 X 1/2 (QTY 5)	343-0137-000		96906	MS1957-17		C10	CAPACITOR,FXD MICA DIEL, 360PF, 5%, 500V	91
H10 WASHER,FLAT CRES, 0.125ID X 0.250 OD (QTY 5)	310-0779-030		96906	MS15795-803		C11	CAPACITOR,FXD MICA DIEL, 390PF, 5%, 500V	91
L60 WASHER,LOCK SST, 0.115 ID X 0.209 OD (QTY 5)	310-0279-000		96906	MS35338-135		C12	NOT USED	
MP1 COIL,RF 2200UH	240-2715-530		96906	MS75089-27		C13	CAPACITOR,FXD MICA DIEL, 390PF, 5%, 500V	91
MP2 GROMMET,RUBBER	201-0001-000		96906	MS35489-4		C14	CAPACITOR,FXD MICA DIEL, 1000PF, 5%, 500V	91
MP3 CABLE	641-7100-013			641-7100-013		C15,C16	CAPACITOR,FXD MICA DIEL, 820PF, 5%, 500V	91
MP4 LABEL,PRESS SENS (ESDS)	280-2745-020		12998	280-2745-020		C17	CAPACITOR,FXD MICA DIEL, 510PF, 5%, 500V	91
A2A3 MOUNT,FILTER	641-7130-001					C18	CAPACITOR,FXD MICA DIEL, 360PF, 5%, 500V	91
A2A1 LOW PASS FILTER	638-6904-001					C19	NOT USED	
A2A2 DIRECTIONAL COUPLER	638-6900-001					C20,C21	CAPACITOR,FXD MICA DIEL, 240PF, 5%, 500V	91
	638-6788-001			638-6788-001		C22	NOT USED	
A2A3 LOW PASS FILTER CIRCUIT CARD	638-6904-001					C23	CAPACITOR,FXD MICA DIEL, 180PF, 5%, 500V	91
CR1-CR4 SEMICONV DEVICE	353-6442-020		04713	1N4002		C24	CAPACITOR,FXD MICA DIEL, 470PF, 5%, 500V	91
C1 NOT USED						C25	CAPACITOR,FXD MICA DIEL, 430PF, 5%, 500V	91
C2-C7 CAPACITOR,FXD CER DIEL, 0.01UF,M20%P80%,50V	913-3331-020		56289	292CY5U103D08050		C26	CAPACITOR,FXD MICA DIEL, 360PF, 5%, 500V	91
C8,C9 NOT USED						C27	CAPACITOR,FXD MICA DIEL, 330PF, 5%, 500V	91
C10 CAPACITOR,FXD MICA DIEL, 430PF, 5%, 500V	912-2861-000		72136	DM15F431J300WV4C		C28	CAPACITOR,FXD MICA DIEL, 150PF, 5%, 500V	91
				R		C29	CAPACITOR,FXD MICA DIEL, 91PF, 5%, 500V	91
C11 CAPACITOR,FXD MICA DIEL, 390PF, 5%, 500V	912-2858-000		81349	CM05FD391J03		C30-C32	NOT USED	
C12 NOT USED						C33	CAPACITOR,FXD MICA DIEL, 68PF, 5%, 500V	91
C13 CAPACITOR,FXD MICA DIEL, 270PF, 5%, 500V	912-2846-000		81349	CM05FD271J03		C34,C35	CAPACITOR,FXD MICA DIEL, 180PF, 5%, 500V	91
C14,C15 CAPACITOR,FXD MICA DIEL, 680PF, 5%, 500V	912-2989-000		81349	CM06FD681J03		C36,C37	CAPACITOR,FXD MICA DIEL, 130PF, 5%, 500V	91
C16 CAPACITOR,FXD MICA DIEL, 510PF, 5%, 500V	912-2980-000		81349	CM06FD511J03		C38	CAPACITOR,FXD MICA DIEL, 75PF, 5%, 500V	91
C17 CAPACITOR,FXD MICA DIEL, 470PF, 5%, 500V	912-2974-000		81349	CM06FD471J03		C39	NOT USED	
C18 CAPACITOR,FXD MICA DIEL, 330PF, 5%, 500V	912-2852-000		81349	CM05FD331J03		C40	CAPACITOR,FXD MICA DIEL, 43PF, 5%, 500V	91
C19 NOT USED						C41	CAPACITOR,FXD MICA DIEL, 47PF, 5%, 500V (A2)	91
C20,C21 CAPACITOR,FXD MICA DIEL, 220PF, 5%, 500V	912-2840-000		81349	CM05FD221J03		C41	CAPACITOR,FXD MICA DIEL, 36PF, 5%, 500V	91
C22 NOT USED						C42	NOT USED	
C23 CAPACITOR,FXD MICA DIEL, 150PF, 5%, 500V	912-2828-000		81349	CM05FD151J03		C43	CAPACITOR,FXD MICA DIEL, 36PF, 5%, 500V (A2)	91
C24,C25 CAPACITOR,FXD MICA DIEL, 390PF, 5%, 500V	912-2858-000		81349	CM05FD391J03		C44	CAPACITOR,FXD MICA DIEL, 62PF, 5%, 500V	91
C26,C27 CAPACITOR,FXD MICA DIEL, 240PF, 5%, 500V	912-2843-000		81349	CM05FD241J03		C45	CAPACITOR,FXD MICA DIEL, 91PF, 5%, 500V	91
C28 CAPACITOR,FXD MICA DIEL, 150PF, 5%, 500V	912-2828-000		81349	CM05FD151J03		C46	CAPACITOR,FXD MICA DIEL, 62PF, 5%, 500V (A1)	91
C29 NOT USED						C46	CAPACITOR,FXD MICA DIEL, 68PF, 5%, 500V	91
C30,C31 CAPACITOR,FXD MICA DIEL, 120PF, 5%, 500V	912-2822-000		81349	CM05FD121J03		C47	CAPACITOR,FXD MICA DIEL, 68PF, 5%, 500V	91
C32 NOT USED						C48	CAPACITOR,FXD MICA DIEL, 56PF, 5%, 500V	91
C33 CAPACITOR,FXD MICA DIEL, 100PF, 5%, 500V	912-2816-000		81349	CM05FD101J03		C49	NOT USED	
C34,C35 CAPACITOR,FXD MICA DIEL, 270PF, 5%, 500V	912-2846-000		81349	CM05FD271J03		C50,C51	CAPACITOR,FXD MICA DIEL, 30PF, 5%, 500V (A1)	91
C36 CAPACITOR,FXD MICA DIEL, 200PF, 5%, 500V	912-2837-000		81349	CM05FD201J03		C50,C51	CAPACITOR,FXD MICA DIEL, 33PF, 5%, 500V	91
C37 CAPACITOR,FXD MICA DIEL, 180PF, 5%, 500V	912-2834-000		81349	CM05FD181J03		C52	NOT USED	
C38 CAPACITOR,FXD MICA DIEL, 100PF, 5%, 500V	912-2816-000		81349	CM05FD101J03		C53	CAPACITOR,FXD MICA DIEL, 22PF, 5%, 500V	91
C39 NOT USED						C54	CAPACITOR,FXD MICA DIEL, 56PF, 5%, 500V (A1)	91
C40,C41 CAPACITOR,FXD MICA DIEL, 68PF, 5%, 500V	912-2804-000		81349	CM05ED680J03		C54	CAPACITOR,FXD MICA DIEL, 68PF, 5%, 500V	91
C42 NOT USED						C55	CAPACITOR,FXD MICA DIEL, 62PF, 5%, 500V	91
C43 CAPACITOR,FXD MICA DIEL, 43PF, 5%, 500V	912-2789-000		81349	CM05ED430J03		C56	CAPACITOR,FXD MICA DIEL, 39PF, 5%, 500V	91
C44 CAPACITOR,FXD MICA DIEL, 130PF, 5%, 500V	912-2825-000		81349	CM05FD131J03		C57	CAPACITOR,FXD MICA DIEL, 43PF, 5%, 500V	91
C45 CAPACITOR,FXD MICA DIEL, 120PF, 5%, 500V	912-2822-000		81349	CM05FD121J03		C58	CAPACITOR,FXD MICA DIEL, 22PF, 5%, 500V (A1)	91
C46 CAPACITOR,FXD MICA DIEL, 91PF, 5%, 500V	912-2813-000		81349	CM05FD910J03		C58	CAPACITOR,FXD MICA DIEL, 27PF, 5%, 500V	91
C47 CAPACITOR,FXD MICA DIEL, 82PF, 5%, 500V	912-2810-000		81349	CM05ED820J03		J1	CONNECTOR,HDR	37
C48 CAPACITOR,FXD MICA DIEL, 56PF, 5%, 500V	912-2798-000		81349	CM05ED560J03				
C49-C63 NOT USED						K1	NOT USED	
C64-C67 CAPACITOR,FXD CER DIEL, 0.01UF,M20%P80%,50V	913-3331-020		56289	292CY5U103D08050		K2-K11	RELAY,REED,RF	410
C68 CAPACITOR,FXD CER DIEL, 0.10UF,M20%P80%,50V	913-3331-030		56289	292CY5U104D08050		L1-L10	COIL,RF 47UH	240
C69 NOT USED						L11	COIL,RF 3.8UH	278
C70 CAPACITOR,FXD CER DIEL, 0.10UF,M20%P80%,50V	913-3331-030		56289	292CY5U104D08050		L12	COIL,RF 2.2UH	278
C71 NOT USED						L13-L20	NOT USED	
C72 CAPACITOR,FXD CER DIEL, 0.10UF,M20%P80%,50V	913-3331-030		56289	292CY5U104D08050		L21	COIL,RF 2.0UH	278
C73 NOT USED						L22	COIL,RF 1.05UH	278
C74 CAPACITOR,FXD CER DIEL, 0.10UF,M20%P80%,50V	913-3331-030		56289	292CY5U104D08050		L23-L30	NOT USED	
J1 CONNECTOR,HDR	372-2656-100		52072	CAD10SP100-230-4		L31	COIL,RF AIR WND, 8 1/2 TURNS	278
				30		L32	COIL,RF AIR WND, 6 TURNS	278
K1-K8 RELAY,REED,RF	410-0585-010		18542	1017-18-1		L33-L40	NOT USED	
L1-L8 COIL,RF 47UH	240-2043-000		96906	MS75085-03		L41	COIL,RF AIR WND, 5 1/2 TURNS	278
L9,L10 NOT USED						L42	AIR WND, 4 TURNS	278
L11 COIL,RF 2.9UH	278-0449-050		20462	278-0449-050		L43-L50	NOT USED	
L12 COIL,RF 1.6UH	278-0449-060		20462	278-0449-060		L51	AIR WND, 4 TURNS	278
L13-L20 NOT USED						L52	AIR WND, 3 1/2 TURNS	278
L21 COIL,RF 1.7UH	278-0449-070		20462	278-0449-070				
L22 COIL,RF 0.95UH	278-0449-080		20462	278-0449-080		CR1,CR2	DIRECTIONAL COUPLER CIRCUIT CARD	636
L23-L30 NOT USED						CR3	SEMICONV DEVICE	353
L31 AIR WND, 11 1/2 TURNS	278-0846-450		02113	278-0846-450		CR4	SEMICONV DEVICE (A1)	353
L32 AIR WND, 7 1/2 TURNS	278-0846-460		02113	278-0846-460		C1,C2	CAPACITOR,VAR AIR DIEL, 0.8 TO 10PF, 250V	922
L33-L40 NOT USED						C3,C4	CAPACITOR,FXD MICA DIEL, 270PF, 5%, 300V	912
L41 COIL,RF AIR WND, 6 TURNS	278-0846-470		02113	278-0846-470		C5,C6	CAPACITOR,FXD CER DIEL, 0.01UF,M20%P80%,50V	913
L42 COIL,RF AIR WND, 5 TURNS	278-0846-480		02113	278-0846-480		C7	NOT USED	
Q1-Q4 TRANSISTOR	352-5035-010		04713	MP5A14		C8,C9	CAPACITOR,FXD MICA DIEL, 10PF, PORM 0.5PF, 500V	912
R1 RESISTOR,FXD CHPSN, 47K, 10%, 1/4W	745-0809-000		81349	RCR07G473KS		C10,C11	CAPACITOR,FXED CER DIEL, 0.1UF, 10%, 100VDC (A1)	913
R2 RESISTOR,FXD CHPSN, 0.10MEGO, 10%, 1/4W	745-0821-000		81349	RCR07G104KS		C12,C13	NOT USED	
R3 RESISTOR,FXD CHPSN, 47K, 10%, 1/4W	745-0809-000		81349	RCR07G473KS		C14	CAPACITOR,FXED CER DIEL, 0.01UF, P80%P20%, 50VDC (A1)	913
R4 RESISTOR,FXD CHPSN, 0.10MEGO, 10%, 1/4W	745-0821-000		81349	RCR07G104KS				
R5 RESISTOR,FXD CHPSN, 47K, 10%, 1/4W	745-0809-000		81349	RCR07G473KS				
R6 RESISTOR,FXD CHPSN, 0.10MEGO, 10%, 1/4W	745-0821-000		81349	RCR07G104KS				
R7 RESISTOR,FXD CHPSN, 47K, 10%, 1/4W	745-0809-000		81349	RCR07G473KS				

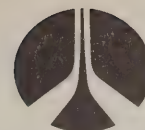


634-6912
TPA-1636-034Low-Pass Filter, Schematic Diagram
Figure 3 (Sheet 3)



634-6912
TPA-1686-034

Low-Pass Filter, Schematic Diagram
Figure 3 (Sheet 3)



Rockwell
International

HF accessories

1. DESCRIPTION

The AC-3810, AC-3811, AC-3812, and AC-3813 filters are for use in the KWM-380 and HF-380 transceivers. The filters provide various bandwidths about a 6.255-MHz center frequency.

The AC-3810 CW Filter kit, Collins part number 642-2439-001, contains a carrier-centered filter; 360-Hz bandwidth at -3-dB points, 1250-Hz bandwidth at -60-dB points.

The AC-3811 CW Filter kit, Collins part number 642-2440-001, contains a carrier-centered filter; 140-Hz bandwidth at -3-dB points, 600-Hz bandwidth at -60-dB points.

The AC-3812 RTTY Filter kit, Collins part number 642-2441-001, contains a carrier-centered filter; 1.7-kHz bandwidth at -3-dB points, 3.4-kHz bandwidth at -60-dB points.

The AC-3813 AM Filter kit, Collins part number 642-2442-001, contains a carrier-centered filter; 6-kHz bandwidth at -3-dB points, 25-kHz bandwidth at -60-dB points.

The AC-3813 (6-kHz) filter is used on pass band tuning circuit card A4. The AC-3810, AC-3811, and AC-3812 filters may be mounted in any of the three remaining locations: one on circuit card A4 and two on passband tuning option card A13. Table 1 lists filter locations that correspond to front panel BW SELECTIVITY switch positions. If all accessory filters are installed, it is suggested that they be installed in order of decreasing bandwidth: 1700 Hz in OPT 1, 360 Hz in OPT 2, and 140 Hz in OPT 3.

Collins AC-3810 AC-3811, AC-3812, and AC-3813 Filter Kits

Table 1. BW SELECTIVITY Switch and Filter Position Relationships.

BW SELECTIVITY SWITCH POSITION	FILTER POSITION ON CIRCUIT CARD
8.0	A4 upper
2.2	A4 middle
OPT 1	A13 lower
OPT 2	A4 lower
OPT 3	A13 upper

2. INSTALLATION

To install the filters, perform the following:

- Remove KWM-380 or HF-380 dust cover by removing four screws from bottom of transceiver.
- Remove card cage cover to expose plug-in circuit cards.
- Refer to figure 1 and remove pass band tuning circuit card from transceiver after removing connectors.

Note

Refer to figures 2 and 3 for filter locations.

- For the AC-3813 only, remove the existing piggyback circuit board filter from the AC-3813 filter location (see figure 2) on the pass band tuning circuit card by removing mounting hardware and unsoldering the four pins. Pins may be cut to aid in disassembly.
- Place mica washers (CPN 302-0640-070) on terminals of filter.
- Install filter onto pass band tuning circuit card and secure filter with two flat washers (CPN 310-0054-000), two lockwashers (310-0095-000), and two hexnuts (CPN 313-0051-000).

AC-3810, AC-3811, AC-3812 and AC-3813 filter kits

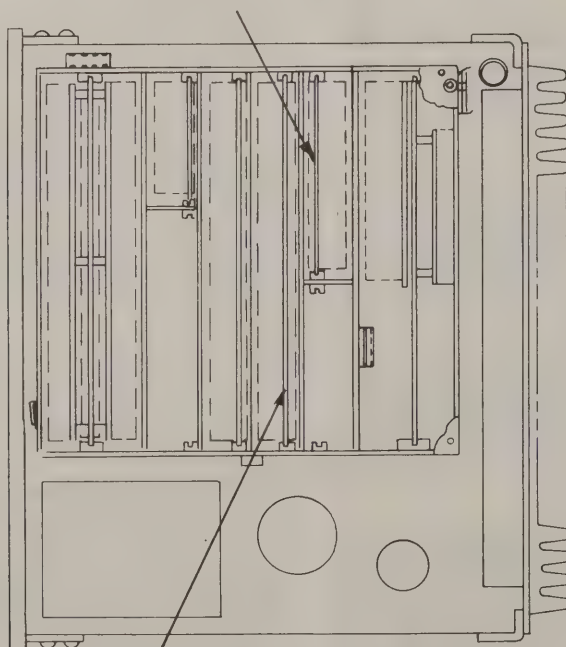
- g. Solder filter terminals to circuit board pads on the circuit card.
- h. Reinstall pass band tuning circuit card into card cage.
- i. Reinstall card cage and dust covers.

3. PARTS LIST

The following table lists the parts in the AC-3810, AC-3811, AC-3812, and AC-3813 filter kits.

AC-3810 QTY	AC-3811 QTY	AC-3812 QTY	AC-3813 QTY	DESCRIPTION	COLLINS PART NUMBER
1	1	1	1	360-Hz bandpass filter	293-1337-040
				140-Hz bandpass filter	293-1337-050
				1.7-kHz bandpass filter	293-1337-020
				6-kHz bandpass filter	293-1337-030
2	2	2	2	Lockwasher, 0.112 diameter	310-0095-000
4	4	4	4	Washer, mica	302-0640-070
2	2	2	2	Washer, flat, 0.112 diameter	310-0054-000
2	2	2	2	Nut, hex, 0.112 x 40	313-0051-000

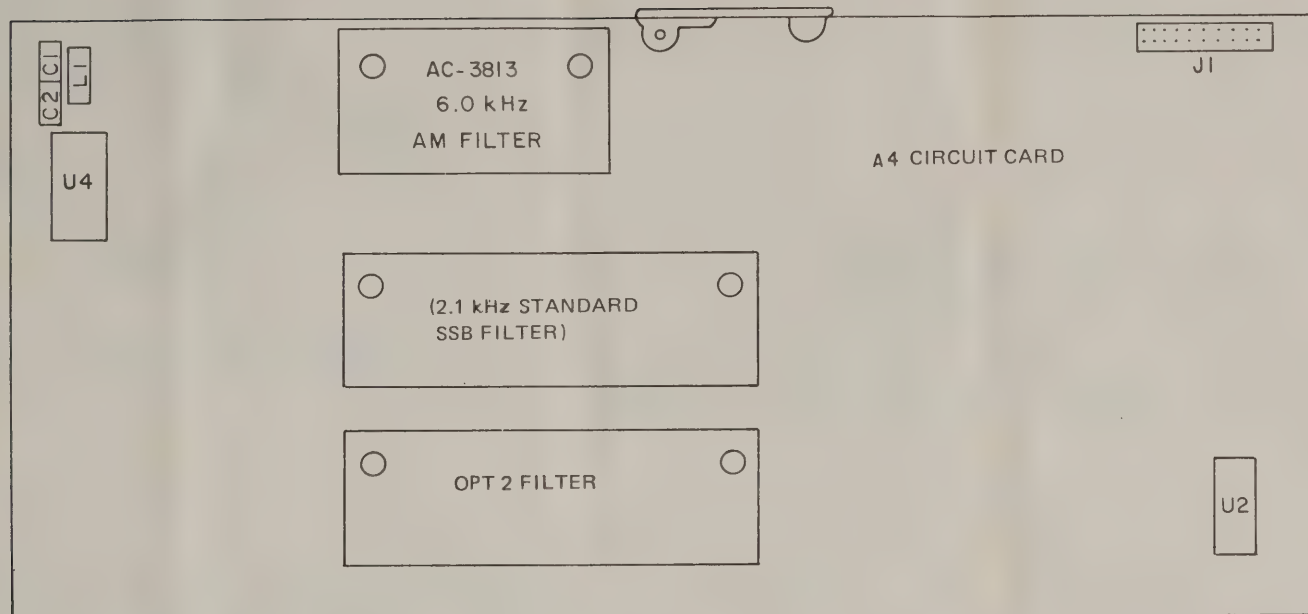
PASS BAND TUNING OPTION,
A13 CIRCUIT CARD



PASS BAND TUNING,
A4 CIRCUIT CARD

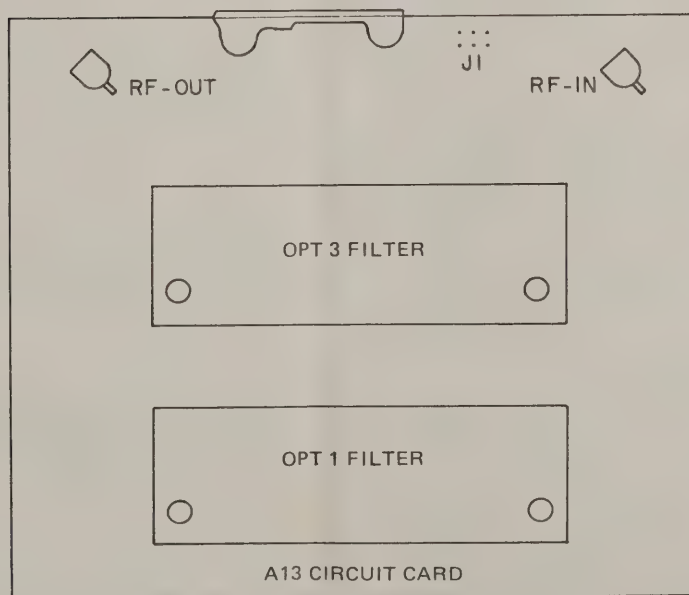
TPA-2221-019

*Transceiver Card Cage
Figure 1*



TPA-2213-011

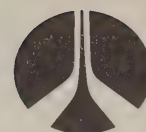
*Pass Band Tuning, Card A4 (CPN 638-6912-001, -002)
Figure 2*



TPA-2214-011

*Pass Band Tuning Option, Card A13 (CPN 638-6914-001)
Figure 3*

Collins Telecommunications Products Division/Rockwell International
Cedar Rapids, Iowa 52498



Rockwell
International

HF accessories

1. DESCRIPTION

The AC-3810, AC-3811, AC-3812, and AC-3813 filters are for use in the KWM-380 and HF-380 transceivers. The filters provide various bandwidths about a 6.255-MHz center frequency.

The AC-3810 CW Filter kit, Collins part number 642-2439-001, contains a carrier-centered filter; 360-Hz bandwidth at -3-dB points, 1250-Hz bandwidth at -60-dB points.

The AC-3811 CW Filter kit, Collins part number 642-2440-001, contains a carrier-centered filter; 140-Hz bandwidth at -3-dB points, 600-Hz bandwidth at -60-dB points.

The AC-3812 RTTY Filter kit, Collins part number 642-2441-001, contains a carrier-centered filter; 1.7-kHz bandwidth at -3-dB points, 3.4-kHz bandwidth at -60-dB points.

The AC-3813 AM Filter kit, Collins part number 642-2442-001, contains a carrier-centered filter; 6-kHz bandwidth at -3-dB points, 25-kHz bandwidth at -60-dB points.

The AC-3813 (6-kHz) filter is used on pass band tuning circuit card A4. The AC-3810, AC-3811, and AC-3812 filters may be mounted in any of the three remaining locations: one on circuit card A4 and two on passband tuning option card A13. Table 1 lists filter locations that correspond to front panel BW SELECTIVITY switch positions. If all accessory filters are installed, it is suggested that they be installed in order of decreasing bandwidth: 1700 Hz in OPT 1, 360 Hz in OPT 2, and 140 Hz in OPT 3.

Collins AC-3810 AC-3811, AC-3812, and AC-3813 Filter Kits

Table 1. BW SELECTIVITY Switch and Filter Position Relationships.

BW SELECTIVITY SWITCH POSITION	FILTER POSITION ON CIRCUIT CARD
8.0	A4 upper
2.2	A4 middle
OPT 1	A13 lower
OPT 2	A4 lower
OPT 3	A13 upper

2. INSTALLATION

To install the filters, perform the following:

- Remove KWM-380 or HF-380 dust cover by removing four screws from bottom of transceiver.
- Remove card cage cover to expose plug-in circuit cards.
- Refer to figure 1 and remove pass band tuning circuit card from transceiver after removing connectors.

Note

Refer to figures 2 and 3 for filter locations.

- For the AC-3813 only, remove the existing piggy-back circuit board filter from the AC-3813 filter location (see figure 2) on the pass band tuning circuit card by removing mounting hardware and unsoldering the four pins. Pins may be cut to aid in disassembly.
- Place mica washers (CPN 302-0640-070) on terminals of filter.
- Install filter onto pass band tuning circuit card and secure filter with two flat washers (CPN 310-0054-000), two lockwashers (310-0095-000), and two hexnuts (CPN 313-0051-000).

AC-3810, AC-3811, AC-3812 and AC-3813 filter kits

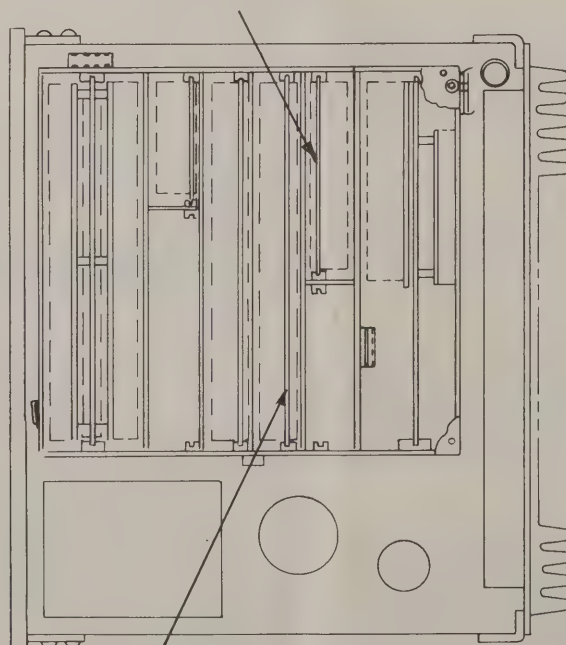
- g. Solder filter terminals to circuit board pads on the circuit card.
- h. Reinstall pass band tuning circuit card into card cage.
- i. Reinstall card cage and dust covers.

3. PARTS LIST

The following table lists the parts in the AC-3810, AC-3811, AC-3812, and AC-3813 filter kits.

AC-3810 QTY	AC-3811 QTY	AC-3812 QTY	AC-3813 QTY	DESCRIPTION	COLLINS PART NUMBER
1	1	1	1	360-Hz bandpass filter	293-1337-040
				140-Hz bandpass filter	293-1337-050
				1.7-kHz bandpass filter	293-1337-020
				6-kHz bandpass filter	293-1337-030
2	2	2	2	Lockwasher, 0.112 diameter	310-0095-000
4	4	4	4	Washer, mica	302-0640-070
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2	2	2	2	Nut, hex, 0.112 x 40	313-0051-000

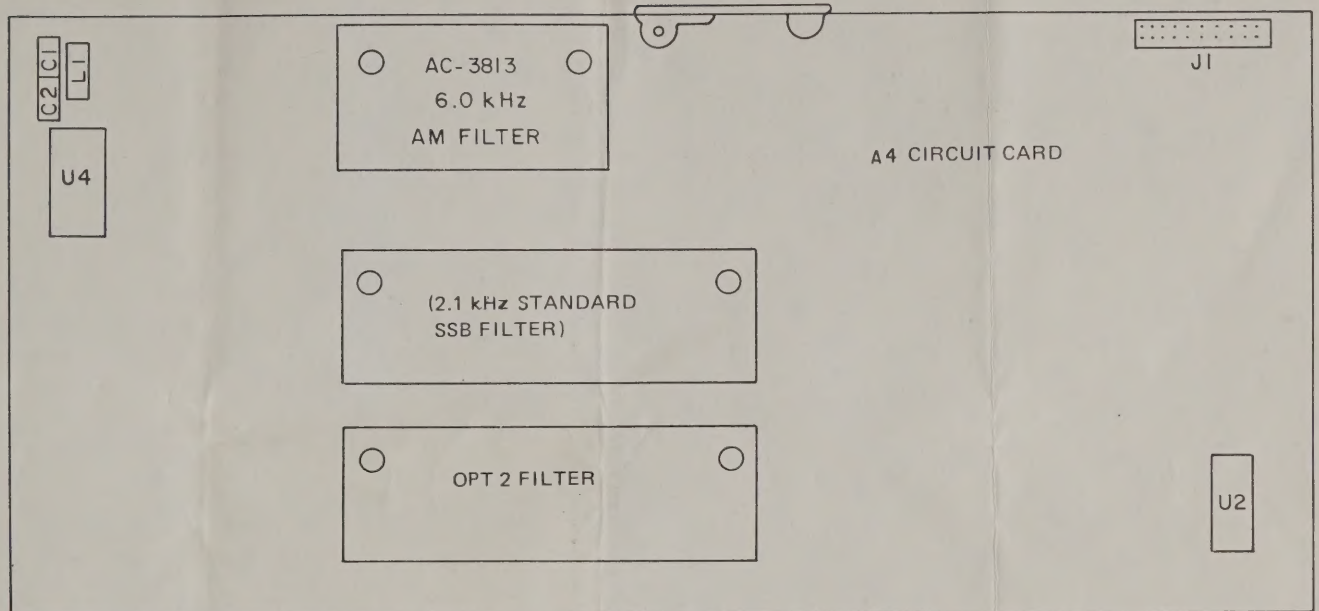
PASS BAND TUNING OPTION,
A13 CIRCUIT CARD



PASS BAND TUNING,
A4 CIRCUIT CARD

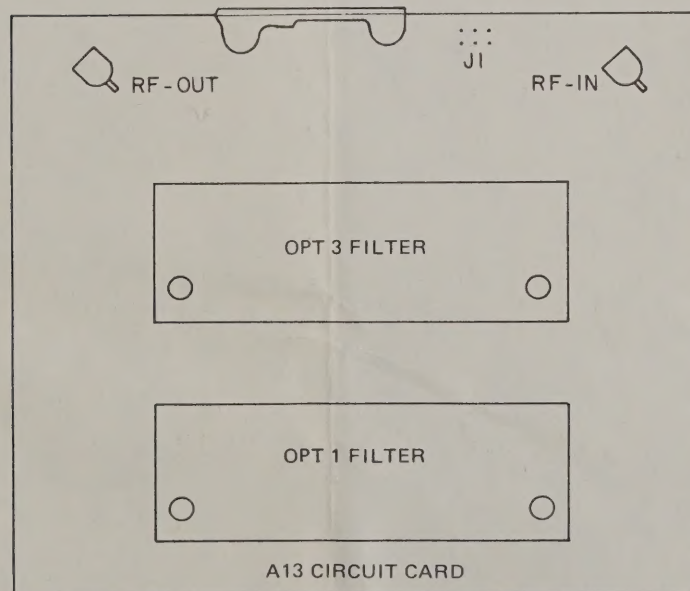
TPA-2221-019

Transceiver Card Cage
Figure 1



TPA-2213-011

*Pass Band Tuning, Card A4 (CPN 638-6912-001, -002)
Figure 2*



TPA-2214-011

*Pass Band Tuning Option, Card A13 (CPN 638-6914-001)
Figure 3*

Collins Telecommunications Products Division/Rockwell International
Cedar Rapids, Iowa 52498

Mead

No. 34702

THE MEAD CORPORATION, DAYTON, OHIO 45463

